The Iron Age

A Review of the Hardware and Metal Trades.

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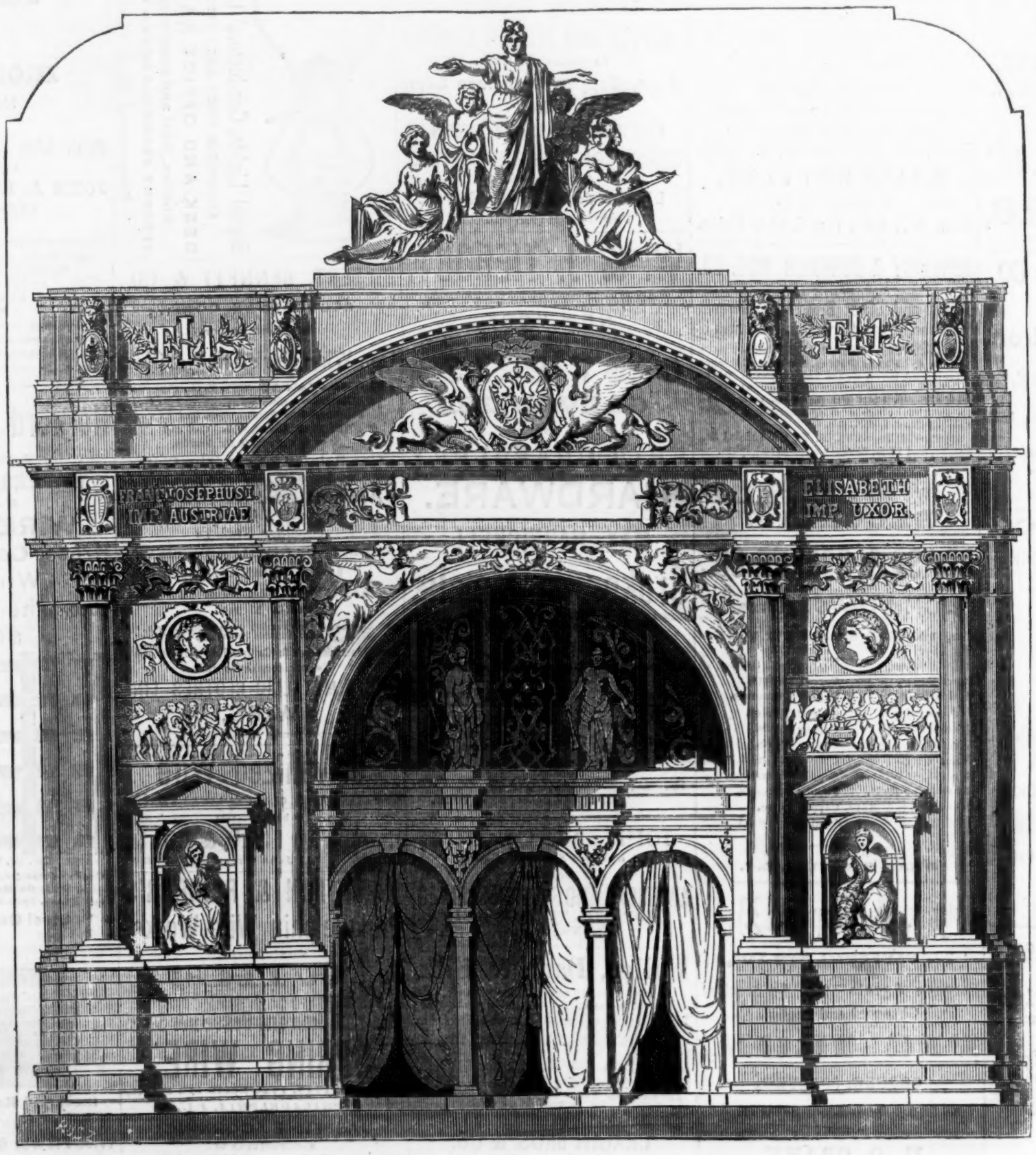
Grand Entrance of the Vienna Exposition Building.

Our accompanying illustration of the principal entrance of the Exposition building, at Vienna, now nearly completed, gives a very correct idea of the artistic taste displayed in the design of the structure.

There will be no greater novelty about the exhibition than its decoration. No paint will be used, but jute (naturally a drab-colored substance) will be stamped with gold, and colors of various hues, and in every description of pattern. In most parts of the building the jute will be left plain; then the columns will be draped in gold and blue, or gold and red, or gold and black; the walls will be hung in drab and gold, or blue and drab. The decorations belong throughout to the Florentine Renaissance period, the style of which displays the utmost gorgeousness and magnificence.



GRAND ENTRANCE OF THE VIENNA EXPOSITION BUILDING.

American Marine Engines.

Of late years the many improvements in engineering construction have enabled boilers to be so built that a higher pressure of steam can with safety be carried. The direct result is the revival of compound engines, whose principles enable high pressure steam to be used to the best effect, and obviate certain practical difficulties which otherwise would prevent sea-going steamers from employing the full benefits of the expansive properties of steam. The engines now being constructed at Messrs. John Roach & Son's works in this city, for the Tennessee, are designed to replace the former machinery, which while in the ship proved utterly insufficient to propel her at a maximum speed of over 10 knots per hour. The new machinery is of the compound type. Four steam cylinders, being placed horizontally on one side of the shaft, act through the medium of two connecting rods backward on the shaft. The two cylinders for the use of the high pressure steam are 40 inches in diameter and 40 inches stroke. Between these and the shaft are placed the two low pressure cylinders, 78 inches in diameter, with the same stroke as the smaller ones. Opposite these, but on the other side of the propeller shaft, is the surface condenser, a massive structure having almost 8000 tubes, 7 feet 9 inches long and ¼ of an inch in diameter. There are 10 boilers, the last one being nearly finished. These are cylindrical, with flat ends, each boiler having two furnaces and 164 tubes, 7 feet 9 inches long by 3¼ inches diameter. The total length of each boiler is 10 feet 6 inches; diameter, 11 feet 6 inches. The total grate surface of the 10 boilers is 478 square feet, and the total heating surface is upward of 13,000 square feet. The iron comprising the shell of these boilers is ¾ of an inch in thickness. It is expected that these will supply steam of 65 pounds pressure, while the engine make 60 turns in a minute, driving a large composition four-bladed propeller weighing upward of 10 tons. The builders have guaranteed that the ship will make 14 knots per hour, and consume but 80 tons of coal per 24 hours. This, for a vessel 375 feet long, can be considered very satisfactory. The superintendent, Mr. Henry Levrat, is the designer, and prides himself, so far, upon having planned the largest compound engine ever built in this country. At first sight, if one were to criticise the machinery of the Tennessee, it might be supposed that the boilers were rather small for the engine, but practice will soon test the skill of the designer and make all criticism useless.

One of the new iron vessels of the Pacific Mail line of steamers is at the dock, receiving a single compound engine imported by the Company from England. The hull of the ship was built in Chester, and is the largest iron steamer ever built on this side of the Atlantic. The Colon, the new boat of the Pacific Mail, is well worth seeing, and any skilled in such matters can examine thoroughly the English style of building machinery. It is refreshing for an American to contemplate the fact that we have not entirely lost the art of which once we were almost at the head, and that we can, in the face of all predictions to the contrary, construct iron vessels at a price not quite ruinous.

Efflorescence of Silver.

An interesting paper was lately read before the Microscopical Society of San Francisco, by Mr. G. Kustel, mining engineer and metallurgist, from which we take the following: There is a peculiarity observable in some silver minerals, principally of sulpherets, when small particles are melted into a globule on charcoal before the blow-pipe. After being melted to a perfectly spherical form, the blowing is stopped, and the globule will appear coated with crystalline metallic silver on cooling. The minerals exhibiting the phenomenon are the following: silver glance, selenide of silver, enciarite, stephanite, brittle silver ore (melanglance), miargyrite, and rich fahlerz. The petzite (from Melone's mine), although among the silver minerals, emits only the pure gold in shape of microscopical globules before the mineral melts Under the microscope, the efflorescence of silver appears wonderfully beautiful, but the interesting part in it is that different minerals show a different aggregation of silver particles on the surface of the globules; and so characteristic that in most instances there is no difficulty in recognizing the mineral from the specialty of the crystalline silver and color of the globule in a minute's time. Only minerals rich in silver emit it, generally over thirty per cent., but not all. Antimony prevents the appearance of silver. So, for instance, margyrite would not show any silver until the antimony was driven out by longer blowing. Rapid cooling, by touching the globule with a needle or some other metallic instrument, increases or creates the efflorescence.

The different appearances of the silver, as observed under the microscope, is about as follows: Silver glance shows isolated round flowers, like stars, often crowded together; silver-copper glance (stephanite), if very rich (fifty per cent. silver), exhibits almost the same characteristics; poorer specimens emit the silver in a shape resembling fine moss. Both minerals give dark, steel-blue globules. The last mineral, with copper largely prevalent, coats the globule with copper, which oxidizes on the surface, causing a dull, rough appearance. Melanglance gives a lead-gray, lustrous globule, showing, if cooled forcibly, from the touching point, long radial threads adhering to the surface of the globule. Selenide of silver makes long, beautiful crystalline leaves. Eucairite (selenide of silver and copper) emits the silver in isolated, thick, upright threads, like the natural silver threads. Margyrite, after the antimony is blown off, displays brilliant, rainbow colors during refrigeration; forcibly cooled, it throws out silver, resembling silver drops that fall in a melted condition on a floor, assuming a flat shape.

A Boston journal makes the following exraordinary suggestion:. Town clocks are not noted for unanimity, and in a large city it is difficult to find two alike. Each church or tower has its own and keeps its own time. The expense of building and maintaining large town clocks is very great. Both the expense and uncertainty of time could be avoided by the use of electricity. In place of expensive clocks in every steeple, one small clock could move the hands on a hundred dials scattered over miles of territory, or, in fact, over a whole State. One good clock in a secure place could deliver every beat of its pendulum through wires to every clock in the town, and all would move absolutely together. Nothing would be needed in the towers but the dials, the hands and some simple machinery to move them under the electric influence from the central clock. Any one who could afford those could have a clock that would require no attention and be always right. The same wires that sound the fire alarm could be used, and the motive clock could be kept in the City Hall. The number of clocks could be enormously multiplied, and all could be maintained for less money than it now takes to keep the few uncertain clocks that we have in our cities in order.

The tonnage of vessels in process of construction on the Delaware river, mainly iron, amounts in the aggregate to 41,500 tons.

Diversified Industry in Philadelphia.

The *Ledger*, of Philadelphia, says: The most apt, felicitous and suggestive incident of the grand Centennial demonstration on Saturday night, was the entree of Disston's sawmakers with their transparency, "1776, saws *im*-ported; none made here—1876, saws *ex*-ported; Philadelphia beats the world." This typifies in compact form the hundred years of progress of this country in the arts of peace that benefit mankind. It was among the complaints of the colonists that they were not permitted to engage in the broad field of manufactures for which the country afforded so many resources. The owner of an iron ore bank could not lawfully fashion his iron into the implements he wanted to use or to sell. The iron had to go to England and come back in the shape of tools. The agriculturist could not lawfully make a hat from the fur taken from an animal caught on his own grounds. One of the early steam engines used for our water works was imported. Now, in how many of the useful products does this country, and even Philadelphia alone, "beat the world," as the sawmakers had it truly blazoned on their banner! Two other manufactories of tools in this city have a fame for the superiority of their implements whereever superior tools are used. The best telegraph "insulator" in use goes out from a quiet little factory in this city to France and England. The "American locomotive," scores of specimens of which go from here, bear off the palm everywhere. There is not an "artificial limb" made abroad that compares favorably at all points with those which go out from some of our unpretending workshops. The products of our tube works, both of iron and of lead, are the best of their kind; and so of light iron railings and ornamental gas fixtures. The New World gave to the Old World the most approved printing machine, without which the great journals of England, France and Germany would have been crippled for many years. Great Britain was plodding along with her old cumbrous printing type moulds long after the United States had offered her greatly superior apparatus, which would do double the work in half the time. We believe they are still making fish-hooks by hand in England, while we have mechanism which takes pieces of wire in its delicate fingers and turns out perfect hooks as fast as grain falls from a mill hopper. The "solid-head" pin machine, the "pointed wood screw" machine, the spike machine, and a long array of other machines, confront us for notice, marshalled by the sewing machines and reaping machines, and other agricultural harvesters, with axes, shovels and other implements that "beat the world," none of which were made here in 1776. But it would be idle to begin the long catalogue with any hope of getting through it within the brief dimensions of a newspaper paragraph.

If Disston's men had been hammer men, instead of saw makers, they could not have hit the nail fairer or squarer on the head.

The Reading *Times and Dispatch* says: Within the past few days the experiment of rolling cast steel ingots into finished rails has been tried with great success at the rolling mills of the Philadelphia and Reading Railroad Company. The steel was made at the Midvale Steel Works, near Philadelphia, by a process similar to the Siemens Martin, and cast into ingots of sections of about nine inches square, and furnished to the rolling mill to be heated and rolled into rails of the regular pattern, 68 lbs. per yard. The rolling was done on the rolls ordinarily worked for iron rails. In this case only twelve passes or grooves were used from the ingot to the rail, which has generally been deemed too rapid a reduction for the steel, and very severe on the machinery, and both were equal to the test.

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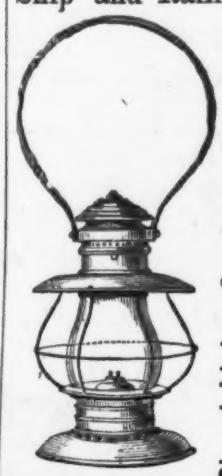

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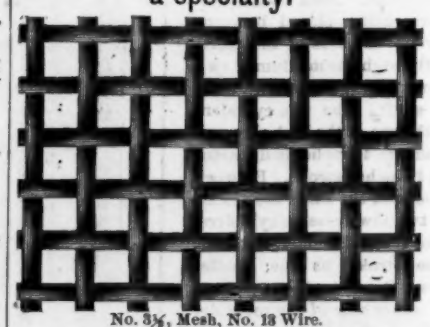

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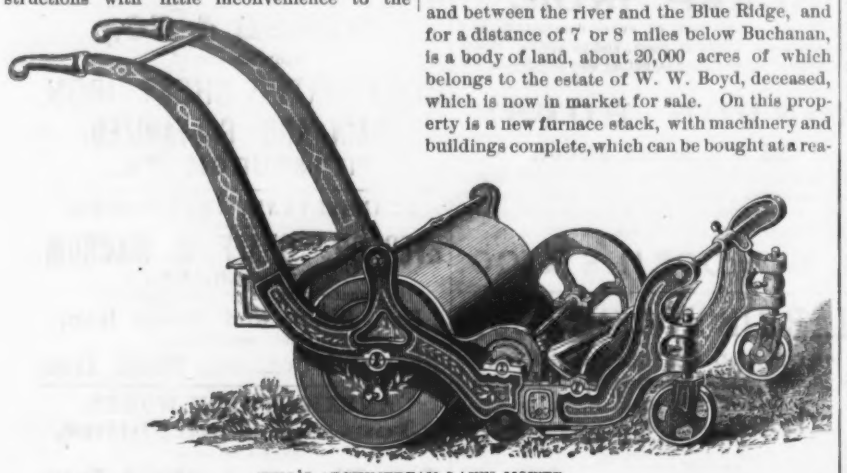
Hill's Archimedean Lawn Mower.

While lawn mowers are acknowledged to be of foreign origin, the improvements which have been made in them in our own country are highly creditable to American genius. The principle of cutting grass by the use of a stationary and a revolving knife has long been employed in the manufacture of these machines, both in Europe and in this country; but it was not until about the year 1868 that they were so constructed as to be of much practical value as hand machines, as they were both too heavy to be easily operated by one man, and also too high-priced to be generally used for small lawns or garden plots.

Mr. Hill's improvements consist mainly in the substitution of velocity for weight or traction power, by which means less labor is required, while at the same time sufficient force is accumulated in the revolving cutter to enable the machine to pass easily over any ordinary obstructions with little inconvenience to the operator. Although the principle of Mr. Hill's original machine has not been materially changed, great improvements have been made in the mechanical construction by the Hill's Archimedean Lawn Mower Company, of Hartford, Conn.



HILL'S ARCHIMEDEAN LAWN MOWER.

It is claimed for this mower that it has a balanced frame, and that by means of its jointed or moveable handle it readily adapts itself to uneven surfaces, which the knife is prevented from striking by an adjustable shoe, which also regulates the hight at which the grass is cut. By the use of emory the knives are put in order without being removed from their place, by simply raising the machine from the ground and reversing the motion. The gear-wheels are covered, thus preventing clogging by any foreign substance. On this machine is also used a solid revolving cutter with steel edges, for which is claimed ease of clearing itself, as well as strength and durability. These points, combined with good workmanship, render this one of the most desirable lawn mowers in the market.

They are manufacturing this year a small machine, cutting ten inches wide, for small lawns, cemetery lots, croquet grounds, and for gardens and grounds where there are shrubs or plants, it being furnished with a guard in front of the knife, which enables the grass to be cut close around the roots without injury to the plant.

Our illustration presents the pony and horse machines, which are similar in construction, and, it is believed, fully equal to their hand-machines, which are too well known in every section of the country to need any further recommendation.

Virginia Ores.

We have received from Mr. H. C. Snyder, of Buchanan, Va., an account of the ores of Allegheny and Botetourt counties, in that State. Mr. Snyder is a practical furnace builder and worker, and has for a number of years been a resident in the section of which he speaks. In view of the effort that is now being made to open the James River and Kanawha Canal, this region becomes important to Western furnace men. The vein of ore near Buchanan, Botetourt county, he writes us, "is not of recent discovery; a portion was opened some years ago, yet recent developments have established the fact that the extent in length is at least three miles, and the probability of its extending nine or ten mile: my own impression is that it does. My reason for this supposition is, that at the point (ten miles) is located the celebrated Retreat ore bank, now owned by Joseph H. Shultz & Co. This vein of ore is on the east slope of Purgatory Mountain; its course is northeast and southwest; it dips with the slope of the mountain at about 65 to 68 degrees; it is in a hard sandstone formation, and lies between a roof rock and a foot rock, and, so far as developed, the two rocks are about 22 to 25 feet apart. The solid part of the vein of ore, so far as developed, varies from three to eight or nine feet thick. The balance of the fissure is filled up with clay and ore. The natural drainage is, on an average, about 200 feet. The elevation above the James River is probably 400 to 450 feet. This ore is not a deposit from the surface, but has unquestionably been injected or forced up by some internal pressure, and caused, no doubt, by heat, as the rock in the vicinity bear unmistakable marks of heat. This being so, the probability is that the vein thickens with depth.

"The character of the ore is brown and red hematite; several fair samples have been assayed, and the analysis was in one case 62½, another 64, and another, of the best brown and red mixed, 68 per cent. From these analyses it will produce in the furnace about 50 per cent. of iron.

"Purgatory Mountain is not over, say, ¾ miles, through from east to west, at what may be termed its base. And there is also a well defined vein of brown and yellow hematite ore in the whole length of the western slope, and this vein also extends from the point of the mountain at the James River to the Retreat ore bank. This is also being fully developed by Messrs. Shultz & Co., who own the property, and intend erecting a furnace this year. This company own very valuable ore lands both in this (Botetourt) county and Allegheny county, any of which is for sale.

"This point is situated at the present terminus of the James River and Kanawha Canal, 50 miles above Lynchburg, and 200 miles above Richmond. Freights about $1·50 to $1·75 per ton to Richmond. Tolls on iron ore, 38 cents per ton of 2000 lbs.

In connection with the above, I will state further that this section of the State has an abundance of iron ore of the best quality that is already developed, and unmistakable indications that the hundreth part has as yet not been developed. On the east side of the river, and between the river and the Blue Ridge, and for a distance of 7 or 8 miles below Buchanan, is a body of land, about 20,000 acres of which belongs to the estate of W. W. Boyd, deceased, which is now in market for sale. On this property is a new furnace stack, with machinery and buildings complete, which can be bought at a reasonable price. The furnace was operated for a short time; has tolerably fair water power; and is a short half mile from the canal; has timber to operate a furnace (I might say) perpetually. The indications for ore on this property are very good."—*American Manufacturer.*

Lehigh Valley Notes.—The Allentown *Chronicle* says: The rolling mill interest of our valley appears just at present to be laboring under difficulties. It seems that while pig iron declined in price last fall only some $7 per ton, bar iron declined over $20 per ton, and now pig iron has advanced from $3 to $4, while bars have not advanced at all; in addition to this, about a year ago, the bar mills of the valley adopted the policy of paying their men on a basis governed by the selling price of manufactured iron. This has not been strictly adhered to, owing to the action of a Philadelphia mill; consequently the valley mills to-day are paying their labor on a basis of 4½ cents per pound, while they are selling their iron at from one to three-tenths of a cent per pound below this, so between the extreme price of pig iron and of labor, our rolling mills are ground between two mill stones. So unremunerative has the business become, that we are informed that the Catasauqua Manufacturing Company, who make more bar iron than all the Philadelphia mills combined, have already stopped work at their Fern Dale mill, and unless some change takes place in the cost of their materials, or an advance occurs in bar iron, this stoppage will speedily be followed by the shutting down of their mills at Catasauqua and Allentown. We hope this may be averted, as the stoppage of these large works during this inclement season must carry distress into many a family.

"Tertiary" Coal of good quality and in paying quantities is being mined at Carbondale and at other points along the line of the Atchison, Topeka and Santa Fe Railroad, in Osage County, Kansas. These coal beds lie from five to thirty feet below the surface, the veins having an average thickness of about eighteen inches.

Lewis, Oliver & Phillips' Patent Bolt Machine.

We present to our readers the accompanying illustrations of bolt machines made by Messrs. Lewis, Oliver & Phillips, of Pittsburgh, manufacturers of Iron Bolts and Heavy Hardware.

The first illustration represents the Bolt Header, consisting mainly of a cast iron body, fly wheels, lift, rocking and shear levers and the heading ram. The castings are well fitted up with gun-metal and steel, and the metal parts, subjected to friction, are chilled. The dies, made of steel, are so constructed and held in position as to admit of being dressed down a great number of times. The machine is free from cogs and springs, thus securing simplicity, strength, durability, compactness and regular motion. The pulley, driven by a six-inch belt, revolves the shaft, the cams on which drive forward the heading ram and raise and lower the levers. The side lever gives motion to the one containing the griping die. The connection between the side and rocking levers is made by a ⅜-inch wrought iron pin, which is in reality the safeguard of the machine; for, if too large a bolt should be fed to the dies, this pin will bend before a casting breaks.

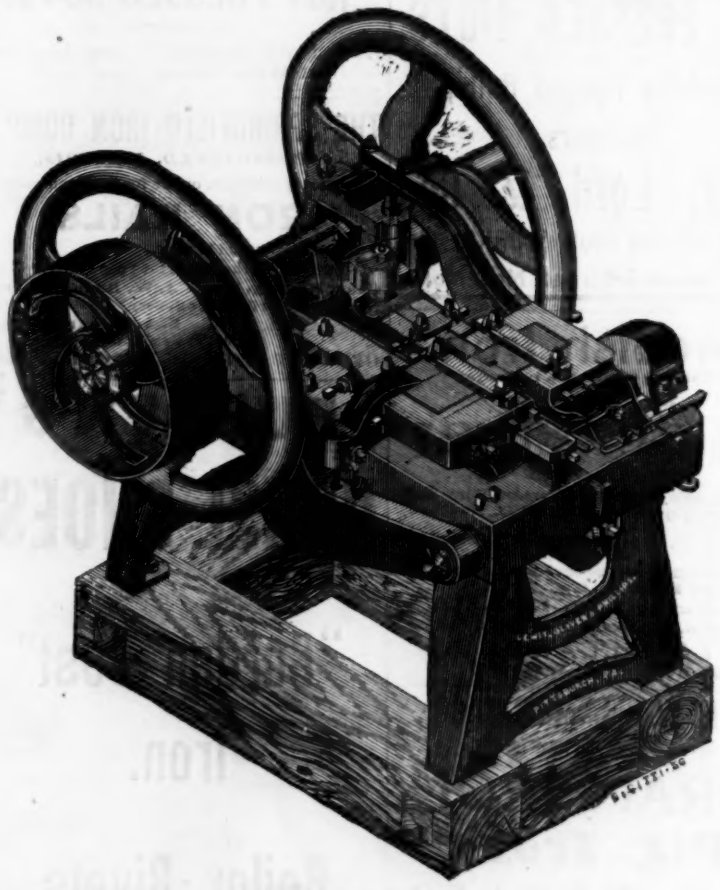
This machine makes all kinds of bolts and rivets, and heads from 3-16 to 1¼ inch iron. A simple change of dies, occupying only five minutes, and which can be made by a boy, enables the operator to make either square, hexagon, T, oval, round, countersunk, or, in fact, any shaped head. And further, any length of bolt can be made without changing the dies.

With one boy heating and one heading, the machine makes in ten hours: 1800 to 2000 square head bolts 1 inch in diameter; 2000 to 2500, ⅞ inch; 3000 to 3500, ¾ inch; 4500 to 5000, ⅝ inch; 5500 to 6000, ½ inch.

Square and hexagon heads are made in the same dies, and can be made alternately. In making track and splice-bar bolts, long rods are heated and fed. In this way from 6000 to 10,000 are made in ten hours.

For beauty of finish and symmetry of form, the work turned out by this machine is, we believe, unsurpassed by any in the world. A convenient and substantial furnace accompanies the machine.

Our next illustration represents their Double Self-acting Screw Cutter. A three-inch belt drives the cone pulley and shaft, by which motion is imparted to the cutting heads. These are made of wrought iron and contain the dies, which are made of the best quality of steel. The jaws work upon fulcrums a little beyond the center of the cutting head, and are closed by a conical wedge in rear, which is the nut for the shaft upon which the small wheels are seen in the rear part of the drawing. By turning this shaft it is made to project any desired length beyond the wedge. A bolt being cut advances until it meets the projecting shaft, which, together with the wedge, it forces back until the wedge is removed from between the jaws, when they are thrown open by the springs seen upon their exterior. The jaws, after being closed by the lever seen on the side, are ready for another bolt. A pump supplies the bolts with oil which runs back to the reservoir and is pumped up again.



BOLT HEADER.

The cutting heads are independent of one another, cut either right or left, and run separately or together.

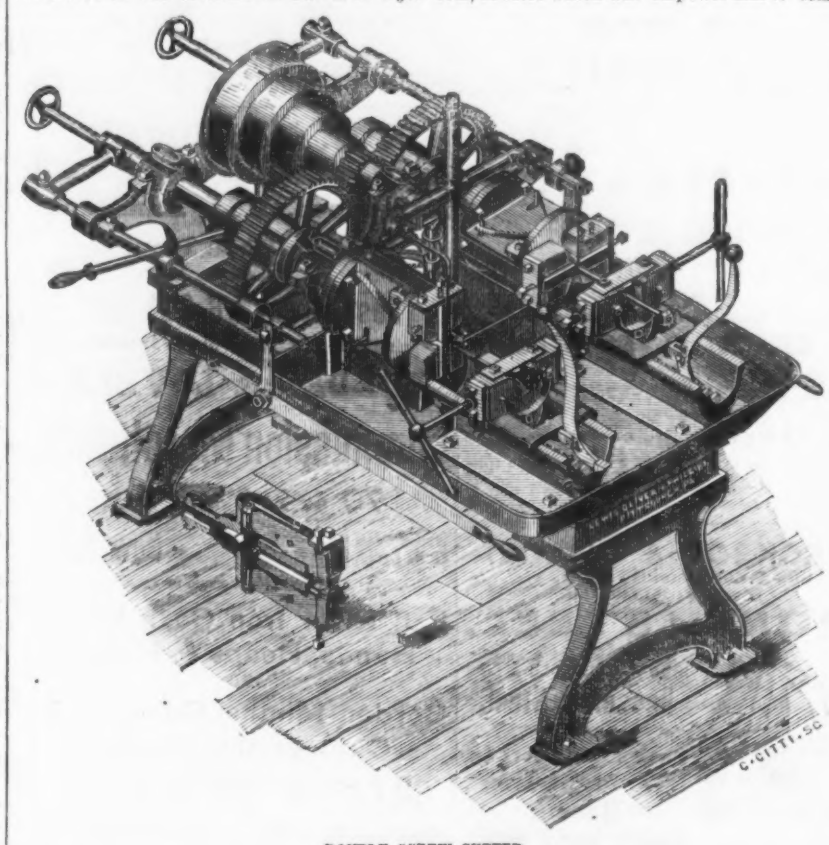
Two sizes of these machines are made; one cuts up to 2¼ and the other to 1¼ inches.

The capacity of the cutter is a little greater than that of the header. Both this machine and the header were recently awarded first premiums at the Cincinnati Industrial Exposition.

This firm also manufacture a Three Spindle, Self-oiling Nut Tapper, a Bolt Pointer and Shears.

All of these machines have been subjected to rigid tests in the works of Messrs. Louis, Oliver & Philips, where about 30 of each have been in constant operation for a number of years, and all the improvements possible have been made from time to time; and we are informed that, so high is the favor with which they are regarded, that more than three-fourths of the car shops and most of the leading railroads in this country and Canada are using them.

Messrs. Lewis, Oliver & Phillips employ at their rolling mills and their bolt factory, foundry and machine shops nearly 2000 workmen. In addition to being the largest bolt manufacturers in the country, they make all kinds of Merchant Bar and Bundle Iron, Strap and T, Screw and Strap, Screw-Hook and Eye Hinges, Bridge and Roof Bolts, patent headed and plain Harrow Teeth, and their new line of Patented Wagon Hardware, which has been illustrated in the columns of *The Iron Age*.



DOUBLE SCREW CUTTER.

They also pay particular attention to rolling peculiar and odd shapes of iron. Their capacity is over 20,000 tons Iron and 10,000 tons Bolts, Nuts, Washers, Hinges, Wagon Hardware, etc., per annum. They are represented in New York by Mr. H. B. Newhall, 11 Warren street.

The following, which we find in the Baltimore *Sun*, will be interesting to travelers by rail, who are compelled to put up with such accommodations as are usually furnished them:

"An elegant "palace car" has just been completed at the Mount Clare Works of the Baltimore and Ohio Railroad Company, designed as a coach of state for the use of the president and directors of the road. The establishment is one of the most elegant jobs ever turned out in Baltimore, reflecting great credit upon the skill and workmanship of our artisans. The car is to bear the name of "Maryland." It is painted a beautiful buff color, is mounted on improved six-wheel trucks, and is provided with patent bumpers, patent air-brakes and other inventions calculated to make traveling less tedious, and more safe than ever. The interior is divided into four apartments—the first a sitting room, in black walnut and birdseye maple, gilded, with green and crimson upholstering, a rich velvet carpet, luxurious furniture, lounges and arm-chairs, and other suitable articles. The second compartment is fitted up for a bed-chamber, containing a handsome low beadstead of oiled maple, richly carved, hung with heavy damask curtains; a lounge covered with salmon-colored silk, figured; a dressing case of exquisite workmanship. Adjoining the chamber is a bath-room, and beyond is the dining-room, arranged to accommodate, if desired, ten or twelve diners. The tables and chairs are stationary, finished in black walnut. The kitchen, one of the most important features of any establishment, occupies the rear end of the car, and is complete in its arrangements for cooking, with range and water-tanks, utensils, &c. The car throughout is of maple and walnut finish, gilded and carved, with plate glass and splendid argand lamps, the whole costing, it is estimated, upward of $45,000—a model and a marvel of splendor and elegance of workmanship."

The London *Railway News* says: "The novelty of a miniature locomotive engine and carriages running upon a miniature railway, with a gauge of only 18 inches, and doing good service, can now be seen in the Royal Arsenal, Woolwich. The rail which at present extends only from the west wharf to the back of the shell foundry, is composed of iron plates cast in the royal laboratory, each of the plates being six feet long and weighing 3½ cwt. They are laid simply on a bed of concrate, keyed together to preserve their position, and the line appears firm and durable, without the aid of sleepers or bolts, such as are employed in the construction of ordinary railways. It was designed and carried out by Col. Scratchley, Royal Engineers, Inspector of Works at the Arsenal. The locomotive, a little engine called the Lord Raglan, draws a number of trucks, laden with about twenty tons of metal, and turns some sharp curves with the utmost ease. It is proposed to extend the line throughout the Arsenal, and supersede as far as possible the transit of heavy loads by contract horses."

It is stated that 104 patents have been granted in this country upon car axles and wheels having the idea in view, of making car wheels to run independently, as in turning a curve,

The Iron Deposits at Ottawa, Canada.

A correspondent says: At a time when iron, one of the greatest agents in promoting our modern civilization, has advanced enormously in price, it may be well to direct attention to the capability of our own country to take its place among the great iron producing nations of the world. It is true that the Ottawa country is destitute of coal, and so far as its own chief resources can contribute each to the other's development, must rely upon charcoal for smelting purpose. Our unsurpassed water communications, however, will enable the ironmaster to import American anthracite, or Nova Scotia coal, at rates which will empower him to compete, in the present state of the iron market, with any foreign or British manufacturer. Within an hour's drive, six miles from the city of Ottawa, are situated the largest of the yet discovered iron deposits in Canada. They are situated in the township of Hull, and only two and a half miles from navigable water, on the Gatineau River, one of the northern tributaries of the Ottawa. These mines extend over a tract running through a low spur of the Laurentian Hills, varying in hight from 100 to 150 feet above the plateau at the base of the range. The geological features indicate volcanic action, the ore appearing to have been thrust through the rock in several places. The ore is magnetic, generally black, but in places colored red by an admixture of hematite. Examinations of the properties of these ores have been made at various times by Sir Wm. Logan, Mr. Billings, of the Geological Survey, Professor Herring, from the United States, and many other gentlemen of eminence in geological and mineralogical science. The estimates of the quantity of ore in these mines has varied considerably, from as high as 250,000,000 down to 26,000,000 tons. Later developments show that the latter figure is far too low, while the greater quantity estimated will probably prove to have been not much exaggerated. At the present moment about 200 tons per day are extracted and transported to a point on the Gatineau River, whence the ore will, on the opening of navigation, be shipped *via* the Rideau Canal to Cleveland, Ohio. An attempt was made in 1867 by a company to manufacture from the ore on the spot, but from various causes they were unable to produce at a price low enough to compete with Scotch iron in the Montreal market, some brands of which were brought out as ballast and sold for $18 to $20 a ton. After two years' experience, which it is to be feared was dearly purchased, the company ceased operations and the property fell into the hands of its present proprietors, who so far have confined themselves to the production and export of the raw material.

The deposit of ore which promises to be next in importance in the vicinity of Ottawa, is one in the township of Templeton, now undergoing development. It is well situated for mining, and but five miles distant from a shipping point, also on the Gatineau River. It is confidently anticipated that this will prove an extensive deposit, and be a rival to the Hull ores, if not in quantity certainly in quality. Another deposit of iron in the neighborhood of the Grenville Canal, on the north shore of the Ottawa, is also attracting notice. It is about four and a half miles from the Ottawa River, and is being developed by its proprietors. To enable the reader to judge of the relative qualities of these ores, it will be necessary merely to place their analyses side by side with that of one of the best Swedish ores, the Dannemora:

	Dannemora.	Hull.	Templeton.	Grenville.
Peroxide of Iron	27·55	66·20	90·87	75·20
Protoxide of Iron	58·93	17·78		
Oxide of Manganese	·10	·25	....	trace.
Lime, Silicate	·28	·76	....	....
Magnesia do	·61	·45	·08	1·34
Lime, Carbonate	....	2·66	·13	8·04
Silica	12·84	10·44	1·34	12·70
Graphite	....	·71	....	....
Phosphorus	trace.	·015	·06	·13
Sulphur	·04	·28	·02	trace.
Alumina	·29	....	·49	·72
Carbonic Acid	·12	....	....	....
Titanic Acid	....	....	3·84*	....
Water, &c	·11	....	1·09	1·50
Pure Metallic Iron	62·06	58·78	64·02	54·35

*A mean of three analyses of this ore give Titanic Acid 1·37,

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Brass Wire	Braziers' Rivets,
Hayden's Patent Brass Kettles,	Copper Tubing,
	Copper Bottoms,
Brass Tubing	Copper Wire,
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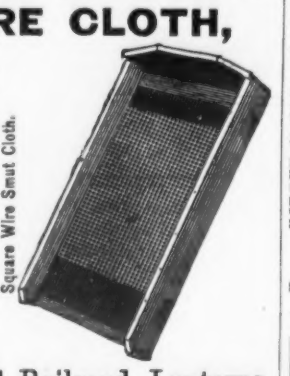

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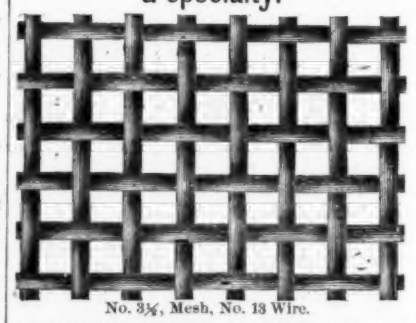

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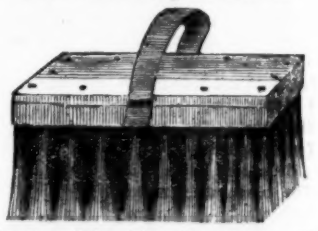

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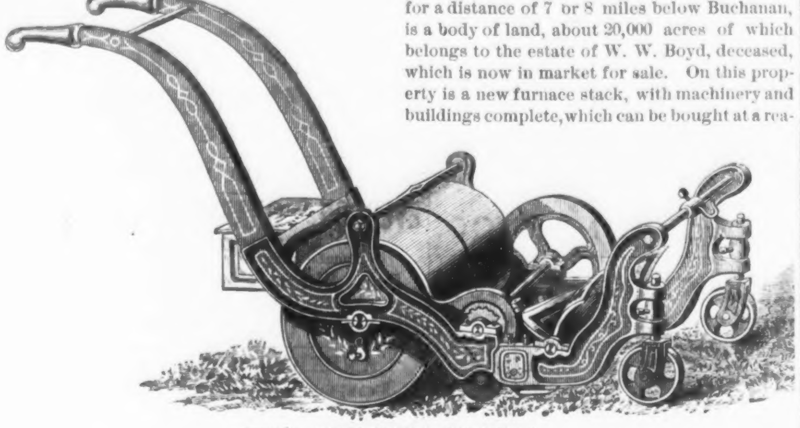
Hill's Archimedean Lawn Mower.

While lawn mowers are acknowledged to be of foreign origin, the improvements which have been made in them in our own country are highly creditable to American genius. The principle of cutting grass by the use of a stationary and a revolving knife has long been employed in the manufacture of these machines, both in Europe and in this country; but it was not until about the year 1868 that they were so constructed as to be of much practical value as hand machines, as they were both too heavy to be easily operated by one man, and also too high-priced to be generally used for small lawns or garden plots.

Mr. Hill's improvements consist mainly in the substitution of velocity for weight or traction power, by which means less labor is required, while at the same time sufficient force is accumulated in the revolving cutter to enable the machine to pass easily over any ordinary obstructions with little inconvenience to the operator. Although the principle of Mr. Hill's original machine has not been materially changed, great improvements have been made in the mechanical construction by the Hill's Archimedean Lawn Mower Company, of Hartford, Conn.



HILL'S ARCHIMEDEAN LAWN MOWER.

It is claimed for this mower that it has a balanced frame, and that by means of its jointed or moveable handle it readily adapts itself to uneven surfaces, which the knife is prevented from striking by an adjustable shoe, which also regulates the hight at which the grass is cut. By the use of emory the knives are put in order without being removed from their place, by simply raising the machine from the ground and reversing the motion. The gear-wheels are covered, thus preventing clogging by any foreign substance. On this machine is also used a solid revolving cutter with steel edges, for which is claimed ease of clearing itself, as well as strength and durability. These points, combined with good workmanship, render this one of the most desirable lawn mowers in the market.

They are manufacturing this year a small machine, cutting ten inches wide, for small lawns, cemetery lots, croquet grounds, and for gardens and grounds where there are shrubs or plants, it being furnished with a guard in front of the knife, which enables the grass to be cut close around the roots without injury to the plant.

Our illustration presents the pony and horse machines, which are similar in construction, and, it is believed, fully equal to their hand-machines, which are too well known in every section of the country to need any further recommendation.

Virginia Ores.

We have received from Mr. H. C. Snyder, of Buchanan, Va., an account of the ores of Allegheny and Botetourt counties, in that State. Mr. Snyder is a practical furnace builder and worker, and has for a number of years been a resident in the section of which he speaks. In view of the effort that is now being made to open the James River and Kanawha Canal, this region becomes important to Western furnace men. The vein of ore near Buchanan, Botetourt county, he writes us, "is not of recent discovery; a portion was opened some years ago, yet recent developments have established the fact that the extent in length is at least three miles, and the probability of its extending nine or ten mile: my own impression is that it does. My reason for this supposition is, that at the point (ten miles) is located the celebrated Retreat ore bank, now owned by Joseph H. Shultz & Co. This vein of ore is on the east slope of Purgatory Mountain; its course is northeast and southwest; it dips with the slope of the mountain at about 65 to 68 degrees; it is in a hard sandstone formation, and lies between a roof rock and a foot rock, and, so far as developed, the two rocks are about 22 to 25 feet apart. The solid part of the vein of ore, so far as developed, varies from three to eight or nine feet thick. The balance of the fissure is filled up with clay and ore. The natural drainage is, on an average, about 200 feet. The elevation above the James River is probably 400 to 450 feet. This ore is not a deposit from the surface, but has unquestionably been injected or forced up by some internal pressure, and caused, no doubt, by heat, as the rock in the vicinity bear unmistakable marks of heat. This being so, the probability is that the vein thickens with depth.

"The character of the ore is brown and red hematite; several fair samples have been assayed, and the analysis was in one case 62½, another 64, and another, of the best brown and red mixed, 68 per cent. From these analyses it will produce in the furnace about 50 per cent. of iron.

"Purgatory Mountain is not over, say, ¾ miles, through from east to west, at what may be termed its base. And there is also a well defined vein of brown and yellow hematite ore in the whole length of the western slope, and this vein also extends from the point of the mountain at the James River to the Retreat ore bank. This is also being fully developed by Messrs. Shultz & Co., who own the property, and intend erecting a furnace this year. This company own very valuable ore lands both in this (Botetourt) county and Allegheny county, any of which is for sale.

"This point is situated at the present terminus of the James River and Kanawha Canal, 50 miles above Lynchburg, and 200 miles above Richmond. Freights about $1·50 to $1·75 per ton to Richmond. Tolls on iron ore, 38 cents per ton of 2000 lbs.

In connection with the above, I will state further that this section of the State has an abundance of iron ore of the best quality that is already developed, and unmistakable indications that the hundreth part has as yet not been developed. On the east side of the river, and between the river and the Blue Ridge, and for a distance of 7 or 8 miles below Buchanan, is a body of land, about 20,000 acres of which belongs to the estate of W. W. Boyd, deceased, which is now in market for sale. On this property is a new furnace stack, with machinery and buildings complete, which can be bought at a reasonable price. The furnace was operated for a short time; has tolerably fair water power; and is a short half mile from the canal; has timber to operate a furnace (I might say) perpetually. The indications for ore on this prop. erty are very good."—*American Manufacturer.*

Lehigh Valley Notes.—The Allentown *Chronicle* says: The rolling mill interest of our valley appears just at present to be laboring under difficulties. It seems that while pig iron declined in price last fall only some $7 per ton, bar iron declined over $20 per ton, and now pig iron has advanced from $3 to $4, while bars have not advanced at all; in addition to this, about a year ago, the bar mills of the valley adopted the policy of paying their men on a basis governed by the selling price of manufactured iron. This has not been strictly adhered to, owing to the action of a Philadelphia mill; consequently the valley mills to-day are paying their labor on a basis of 4½ cents per pound, while they are selling their iron at from one to three-tenths of a cent per pound below this, so between the extreme price of pig iron and of labor, our rolling mills are ground between two mill stones. So unremunerative has the business become, that we are informed that the Catasauqua Manufacturing Company, who make more bar iron than all the Philadelphia mills combined, have already stopped work at their Fern Dale mill, and unless some change takes place in the cost of their materials, or an advance occurs in bar iron, this stoppage will speedily be followed by the shutting down of their mills at Catasauqua and Allentown. We hope this may be averted, as the stoppage of these large works during this inclement season must carry distress into many a family.

"Tertiary" Coal of good quality and in paying quantities is being mined at Carbondale and at other points along the line of the Atchison, Topeka and Santa Fe Railroad, in Osage County, Kansas. These coal beds lie from five to thirty feet below the surface, the veins having an average thickness of about eighteen inches.

Lewis, Oliver & Phillips' Patent Bolt Machine.

We present to our readers the accompanying illustrations of bolt machines made by Messrs. Lewis, Oliver & Phillips, of Pittsburgh, manufacturers of Iron Bolts and Heavy Hardware.

The first illustration represents the Bolt Header, consisting mainly of a cast iron body, fly wheels, lift, rocking and shear levers and the heading ram. The castings are well fitted up with gun-metal and steel, and the metal parts, subjected to friction, are chilled. The dies, made of steel, are so constructed and held in position as to admit of being dressed down a great number of times. The machine is free from cogs and springs, thus securing simplicity, strength, durability, compactness and regular motion. The pulley, driven by a six-inch belt, revolves the shaft, the cams on which drive forward the heading ram and raise and lower the levers. The side lever gives motion to the one containing the griping die. The connection between the side and rocking levers is made by a ⅜-inch wrought iron pin, which is in reality the safeguard of the machine; for, if too large a bolt should be fed to the dies, this pin will bend before a casting breaks.

This machine makes all kinds of bolts and rivets, and heads from 3-16 to 1¼ inch iron. A simple change of dies, occupying only five minutes, and which can be made by a boy, enables the operator to make either square, hexagon, T, oval, round, countersunk, or, in fact, any shaped head. And further, any length of bolt can be made without changing the dies.

With one boy heating and one heading, the machine makes in ten hours: 1800 to 2000 square head bolts 1 inch in diameter; 2000 to 2500, ⅞ inch; 3000 to 3500, ¾ inch; 4500 to 5000, ⅝ inch; 5500 to 6000, ½ inch.

Square and hexagon heads are made in the same dies, and can be made alternately. In making track and splice-bar bolts, long rods are heated and fed. In this way from 6000 to 10,000 are made in ten hours.

For beauty of finish and symmetry of form, the work turned out by this machine is, we believe, unsurpassed by any in the world. A convenient and substantial furnace accompanies the machine.

Our next illustration represents their Double Self-acting Screw Cutter. A three-inch belt drives the cone pulley and shaft, by which motion is imparted to the cutting heads. These are made of wrought iron and contain the dies, which are made of the best quality of steel. The jaws work upon fulcrums a little beyond the center of the cutting head, and are closed by a conical wedge in rear, which is the nut for the shaft upon which the small wheels are seen in the rear part of the drawing. By turning this shaft it is made to project any desired length beyond the wedge. A bolt being cut advances until it meets the projecting shaft, which, together with the wedge, it forces back until the wedge is removed from between the jaws, when they are thrown open by the springs seen upon their exterior. The jaws, after being closed by the lever seen on the side, are ready for another bolt. A pump supplies the bolts with oil which runs back to the reservoir and is pumped up again.

BOLT HEADER.

The cutting heads are independent of one another, cut either right or left, and run separately or together.

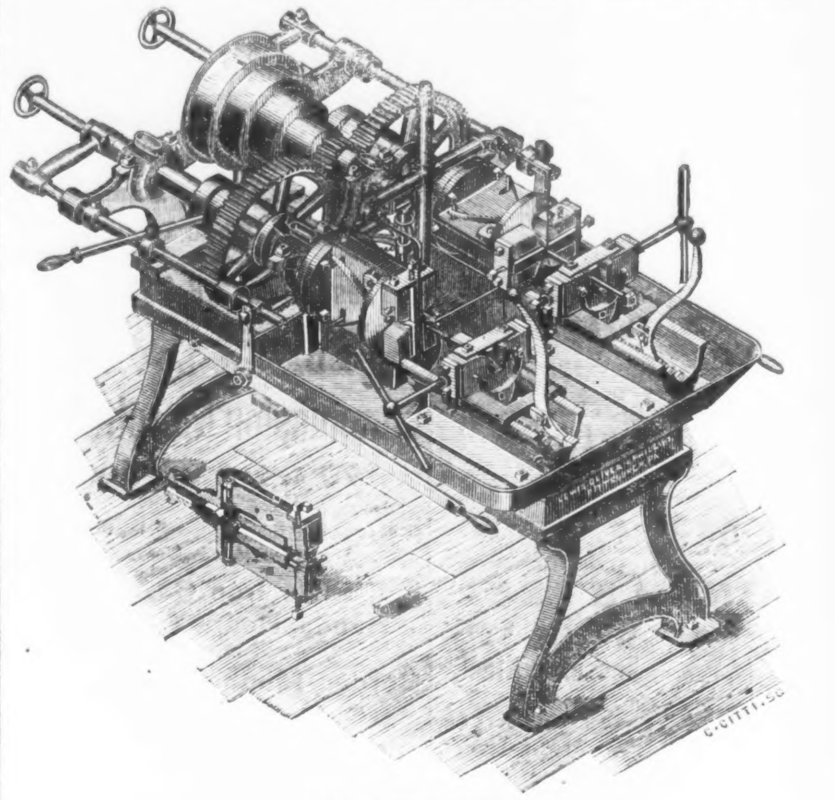
Two sizes of these machines are made; one cuts up to 2¼ and the other to 1¼ inches.

The capacity of the cutter is a little greater than that of the header. Both this machine and the header were recently awarded first premiums at the Cincinnati Industrial Exposition.

This firm also manufacture a Three Spindle, Self-oiling Nut Tapper, a Bolt Pointer and Shears.

All of these machines have been subjected to rigid tests in the works of Messrs. Louis, Oliver & Philips, where about 30 of each have been in constant operation for a number of years, and all the improvements possible have been made from time to time; and we are informed that, so high is the favor with which they are regarded, that more than three-fourths of the car shops and most of the leading railroads in this country and Canada are using them.

Messrs. Lewis, Oliver & Phillips employ at their rolling mills and their bolt factory, foundry and machine shops nearly 2000 workmen. In addition to being the largest bolt manufacturers in the country, they make all kinds of Merchant Bar and Bundle Iron, Strap and T, Screw and Strap, Screw-Hook and Eye Hinges, Bridge and Roof Bolts, patent headed and plain Harrow Teeth, and their new line of Patented Wagon Hardware, which has been illustrated in the columns of *The Iron Age.*



DOUBLE SCREW CUTTER.

They also pay particular attention to rolling peculiar and odd shapes of iron. Their capacity is over 20,000 tons Iron and 10,000 tons Bolts, Nuts, Washers, Hinges, Wagon Hardware, etc., per annum. They are represented in New York by Mr. H. B. Newhall, 11 Warren street.

The following, which we find in the Baltimore *Sun*, will be interesting to travelers by rail, who are compelled to put up with such accommodations as are usually furnished them:

"An elegant "palace car" has just been completed at the Mount Clare Works of the Baltimore and Ohio Railroad Company, designed as a coach of state for the use of the president and directors of the road. The establishment is one of the most elegant jobs ever turned out in Baltimore, reflecting great credit upon the skill and workmanship of our artisans. The car is to bear the name of "Maryland." It is painted a beautiful buff color, is mounted on improved six-wheel trucks, and is provided with patent bumpers, patent air-brakes and other inventions calculated to make traveling less tedious, and more safe than ever. The interior is divided into four apartments—the first a sitting room, in black walnut and birdseye maple, gilded, with green and crimson upholstering, a rich velvet carpet, luxurious furniture, lounges and arm-chairs, and other suitable articles. The second compartment is fitted up for a bed-chamber, containing a handsome low beadstead of oiled maple, richly carved, hung with heavy damask curtains; a lounge covered with salmon-colored silk, figured; a dressing case of exquisite workmanship. Adjoining the chamber is a bathroom, and beyond is the dining-room, arranged to accommodate, if desired, ten or twelve diners. The tables and chairs are stationary, finished in black walnut. The kitchen, one of the most important features of any establishment, occupies the rear end of the car, and is complete in its arrangements for cooking, with range and water-tanks, utensils, &c. The car throughout is of maple and walnut finish, gilded and carved, with plate glass and splendid argand lamps, the whole costing, it is estimated, upward of $45,000—a model and a marvel of splendor and elegance of workmanship."

The London *Railway News* says: "The novelty of a miniature locomotive engine and carriages running upon a miniature railway, with a gauge of only 18 inches, and doing good service, can now be seen in the Royal Arsenal, Woolwich. The rail which at present extends only from the west wharf to the back of the shell foundry, is composed of iron plates cast in the royal laboratory, each of the plates being six feet long and weighing 3½ cwt. They are laid simply on a bed of concrate, keyed together to preserve their position, and the line appears firm and durable, without the aid of sleepers or bolts, such as are employed in the construction of ordinary railways. It was designed and carried out by Col. Scratchley, Royal Engineers, Inspector of Works at the Arsenal. The locomotive, a little engine called the Lord Raglan, draws a number of trucks, laden with about twenty tons of metal, and turns some sharp curves with the utmost ease. It is proposed to extend the line throughout the Arsenal, and supersede as far as possible the transit of heavy loads by contract horses."

It is stated that 104 patents have been granted in this country upon car axles and wheels having the idea in view, of making car wheels to run independently, as in turning a curve.

The Iron Deposits at Ottawa, Canada.

A correspondent says: At a time when iron, one of the greatest agents in promoting our modern civilization, has advanced enormously in price, it may be well to direct attention to the capability of our own country to take its place among the great iron producing nations of the world. It is true that the Ottawa country is destitute of coal, and so far as its own chief resources can contribute each to the other's development, must rely upon charcoal for smelting purpose. Our unsurpassed water communications, however, will enable the ironmaster to import American anthracite, or Nova Scotia coal, at rates which will empower him to compete, in the present state of the iron market, with any foreign or British manufacturer. Within an hour's drive, six miles from the city of Ottawa, are situated the largest of the yet discovered iron deposits in Canada. They are situated in the township of Hull, and only two and a half miles from navigable water, on the Gatineau River, one of the northern tributaries of the Ottawa. These mines extend over a tract running through a low spur of the Laurentian Hills, varying in hight from 100 to 150 feet above the plateau at the base of the range. The geological features indicate volcanic action, the ore appearing to have been thrust through the rock in several places. The ore is magnetic, generally black, but in places colored red by an admixture of hematite. Examinations of the properties of these ores have been made at various times by Sir Wm. Logan, Mr. Billings, of the Geological Survey, Professor Herring, from the United States, and many other gentlemen of eminence in geological and mineralogical science. The estimates of the quantity of ore in these mines has varied considerably, from as high as 250,000,000 down to 26,000,000 tons. Later developments show that the latter figure is far too low, while the greater quantity estimated will probably prove to have been not much exaggerated. At the present moment about 200 tons per day are extracted and transported to a point on the Gatineau River, whence the ore will, on the opening of navigation, be shipped *via* the Rideau Canal to Cleveland, Ohio. An attempt was made in 1867 by a company to manufacture from the ore on the spot, but from various causes they were unable to produce at a price low enough to compete with Scotch iron in the Montreal market, some brands of which were brought out as ballast and sold for $18 to $20 a ton. After two years' experience, which it is to be feared was dearly purchased, the company ceased operations and the property fell into the hands of its present proprietors, who so far have confined themselves to the production and export of the raw material.

The deposit of ore which promises to be next in importance in the vicinity of Ottawa, is one in the township of Templeton, now undergoing development. It is well situated for mining, and but five miles distant from a shipping point, also on the Gatineau River. It is confidently anticipated that this will prove an extensive deposit, and be a rival to the Hull ores, if not in quantity certainly in quality. Another deposit of iron in the neighborhood of the Grenville Canal, on the north shore of the Ottawa, is also attracting notice. It is about four and a half miles from the Ottawa River, and is being developed by its proprietors. To enable the reader to judge of the relative qualities of these ores, it will be necessary merely to place their analyses side by side with that of one of the best Swedish ores, the Dannemora:

	Dannemora.	Hull.	Templeton.	Grenville.
Peroxide of Iron....	27·55	66·20		
Protoxide of Iron...	58·93	17·78	90·87	75·20
Oxide of Manganese.	·10	·25	....	trace.
Lime, Silicate.......	·38	·76	....	....
Magnesia do........	·61	·45	·08	1·34
Lime, Carbonate....	....	2·66	·13	8·04
Silica............	12·54	10·44	1·34	12·70
Graphite..........	....	·71	....	....
Phosphorus........	trace.	·015	·06	·13
Sulphur...........	·04	·28	·02	trace.
Alumina...........	·29	....	·49	·72
Carbonic Acid......	·12	....	....	....
Titanic Acid........	....	....	3·84*	....
Water, &c.........	·11	....	1·09	1·30
Pure Metallic Iron..	62·06	58·78	64·02	54·35

* A mean of three analyses of this ore give Titanic Acid 1·57.

Iron.

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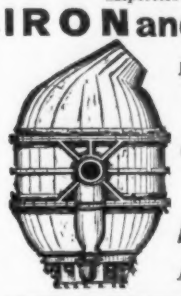
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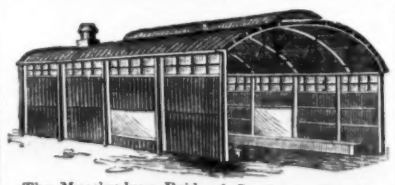
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Steam Boiler Explosions.

Mr. Carlisle Mason, of Chicago, has sent to the Supervising Inspector of Steamboats, at Washington, a communication, from which we take the following:

Many thinking men, skilled in engineering, have thought they had discovered the cause of so much disaster, in electricity generated in the boiler; in decomposition of water, thereby producing explosive gases; the expansion of metals; and the popular theory of low water. I have have always been skeptical on these points; especially so of the theory that *all* explosions are occasioned by low water, from the fact that the small amount of heating surface exposed to the water is, in theory, only capable of raising the temperature of the water in the boiler, say fifteen or twenty degrees at the most, even when red hot; not sufficient, certainly, to be the cause of such fearful disaster. * * *

I think I am within the limits of observation when I say that the rise of water in a boiler, when the engine is started and running, is all of two inches, often more. I have found, on stopping the engine to try the water, that it has been lowered two guages without extra foaming, as it is called. I find, when the engine and boiler are at rest, the water remains perfectly still, without any ebullition; but, the moment the steam is drawn off by any cause, boiling takes place, and the water rises in the boiler. The globules of steam rising through the water must have place; hence, when the water is filled with them, it must occupy more space; and just here it has troubled me to know what became of all the heat or caloric taken up by the water while the boiler was at rest. Experiments have shown that the water can be heated to a much higher temperature when at rest than when the steam is drawn off as it is generated; and, becoming satisfied of this, I have found the following results: A small boiler, twenty inches in diameter and four feet long, was placed in the brickwork, with fire surface underneath. It was filled half full of water, and through its upper side (kept tight by a stuffing-box) a rod was passed down into the water, on the end of which a cross-piece was fastened, and of suffient length to be turned in the water. On the top of the rod (outside) another cross-tail was placed, and a rope attached to each end was led to a safe distance. Steam was now raised until the gauge indicated one hundred and fifty pounds. The ropes were pulled and the water violently agitated. The boiler exploded in an instant. This was repeated with a pressure-gauge which would indicate by a pointer-hand, and the result was the same; leaving the pointer-hand as high as it would go—I believe 450 pounds. Again, a glass-retort was placed over a spirit-lamp, and the water was brought to a boil, when it immediately rose in the retort some distance, but, on stopping the outlet of steam, it fell to its original hight. After getting up a pressure of steam, it was again opened, and the water overflowed, but subsided on partially checking the flow of steam. Now, we find from the shape of our boilers, as usually constructed, that the steam or gas, when generated, has not only to push its way through a column of water, but diffuses itself through the whole mass, and cannot escape until the whole is charged with all it can contain, and, when liberated, it will rush to the point of egress with all possible despatch, nor will it wait to be liberated from its wet bath, but carry water with it, producing what is called foaming. I have observed, and inquiry among engineers confirms the observation, that, when an engine is started, after having been at rest for a time, the steam will rise several pounds, gradually receding to its original pressure. This seems to indicate plainly that there is steam, or caloric to make it, stored away in the water of the boiler, and this, in my opinion, is the cause of very many of our explosions. We have every reason to believe from the testimony of many men—some of them on their death beds—that they saw the water tried and found plenty in the gauge-cocks but a moment before an explosion. In seeking for a remedy for the retention by the water of this heat or steam, I was first led to believe if the water could be agitated it would answer the purpose, but I found it very difficult to do so by mechanical means, and so confined my experiments to a thorough circulation of the water in the boiler, and have so far succeeded as to fully confirm my former conclusions.

I place outside or inside of boilers a horizontal pipe or pipes so arranged that they will be about level with the water line, and have openings at intervals to receive their supply at or near the surface of the water; it is then communicated to the mud pipes or pipes which communicate with the bottom of the boiler, at proper intervals, to give a general and good circulating supply. This method I find best adapted when the water contains a large portion of solid or earthy matter, giving it an ample opportunity to settle in the mud pipes, where it can be blown off at pleasure, thereby keeping the boilers clean and free from mud and scale. Yet, in a common boiler with two or more flues, where the circulation is all that would be desired, I place in the center of the boiler, between the flues, two partitions made of sheet iron; the upper side or edge is about two inches below the water line (at its lowest), and the bottom edge is within three inches of the bottom of the boiler, forming between the partitions a pipe, as it were, to conduct the water to the bottom of the boiler. The operation is very simple, yet very effective, and, even long before steam is formed, the circulation is very rapid. The result is most apparent in a battery of four boilers, where water was at all times carried over to the engine, and varied in the gauge cocks at every fire put under the boilers. It is now all as still and smooth as if no fire were under. It has also proved a saving of fuel; the free escape of steam tending to this. I believe, therefore, when boilers are standing still, the circulation will prevent any more caloric from being retained by the water than is indicated by the pressure gauge. I believe, too, that the main body of the water will remain at a temperature not greatly exceeding 212° Fah.

A Burning Mine at Sheffield.

At Parkgate, near Sheffield, a most extraordinary phenomenon can be seen by all interested in colliery wonders. About one hundred years ago, several Parkgate gentlemen sank a shaft known as the Old Basset Pit. They at once found a rich seam of coal—the Barnsley bed, nine feet in thickness. This coal was worked in a very careful fashion for several years—great blocks and pillars of coal, containing many tons, being left to support the roof in place of the modern wooden props. For several seasons everything proceeded smoothly; but one day the pit caught fire. Nobody can tell how it was ignited; and the ancient miners appear to have been utterly dismayed by the unexpected disaster, as they left the pit to burn at will, instead of closing up the shaft and commencing anew, as they might have done. Many years afterward "the burning pit" was again approached by the lord of the manor, Earl Fitzwilliam, who began to work out coal in the locality. A shaft was sunk at some distance from the Old Basset Pit, and the coal in the direction of Rawmarsh was got at—the new workings being kept at what was considered a safe distance from the fiery pit. Everything proceeded satisfactorily till 1868, when a miner named Parkin descended the Bank Pit shaft—the name by which the new shaft was known—and was greatly alarmed to find fire only ten feet from the pit bottom. He at once gave the alarm—the principal officials were upon the spot, and efforts made to extinguish the fire. "Parkin's flames" were soon put out; but it was found that the whole pit was on fire, and as the Earl's collieries extended for miles, it was feared that the fire would spread over the entire workings. The Old Basset shaft was at once filled up; the old Bank shaft was also closed; a third shaft, the Top Stubbin Pit, was also filled up. A long and thick wall was built to separate the Old Basset workings from the newly opened portions of the pit. Explorations had to be conducted by crawling on hands and knees in the midst of suffocating smoke; but the wall was at length completed at tremendous expense and great labor—it being 1000 yards in length, and from one foot to five feet thick. Cross walls were also built to cut off air ways, and so help in choking the fire. Thick iron pipes, with iron plugs, were inserted in the wall at intervals of fifty yards, so that views could be obtained of the Old Basset workings looking through these pipes. The great wall occupied the time of a large body of workmen for a whole year. A new "futtrell"—the entrance to a coal mine—had to be constructed. It had to be brick-arched above and below with strong brick walls. Entering by this place, the wall is inspected daily, to get information if the old fire has reached it in any way. The last fire was seen in 1872, and on being examined lately, nothing but "black damp" came through the orifices; but the most dangerous place—where the workmen labored at a great wall at the peril of their lives—is believed to be the fiery stronghold. Here the flames are still believed to be raging, although securely imprisoned by the work of the underground heroes who built its prison walls. Until a year or two ago, the farmers found that their crops over this pit were materially accelerated in growth by the heat; and the fact that this acceleration is not so apparent now is the strongest proof to professional minds that the burning pit has about spent its strength after a "long fire" of one hundred years.

Improvement in Colliery Winding Gear.

The London *Mining Journal* says: At the Mimmins Colliery, at Willenhall, belonging to Mr. Matthew Tildesley, some winding machinery has just been put up, which is attracting much attention in the locality, and that deserves to be widely known, for it seems to be applicable to pits of which the depth is not very considerable. The machinery embraces not only compact winding gear, but likewise the means of preventing over-winding, that merit the consideration of colliery engineers. Boiler, engine, and winding gear are all at the pit's mouth, and cover a space of only a few yards square. The engine and boiler are both under one roof; the grate is constructed so as to effect complete combustion, notwithstanding that the slack used has hitherto been regarded as bank refuse. The boiler is vertical, and possesses a large heating surface of 250 feet. The engine also is vertical, bolted to a frame standing on one side of the shaft mouth, where it works direct a drum fixed over the pit on another frame. On the opposite side of the shaft is the fly-wheel, and to this wheel there is attached a break, which securely grips it until the engineman is at his post, which is at the side of the banksman. To release the break, the principle in use in the north of England has been adopted—the engineman, directly that he takes his stand in the position assigned to him, working by his own weight the lever which disengages the brake. To stop the fly-wheel and to apply the break he has, therefore, only to remove his foot. To the lever, by which the break is applied to the fly-wheel, Mr. Tildesley has attached an iron bar, through which the draw chain runs, and so soon as the skip reaches the required hight at the top of the shaft the action of the bar locks the fly-wheel in the grip of the brake, and keeps the skip securely suspended at that point. Owing to the use of the open grate the fire is understood to require renewal only once in about two or three hours. The whole of the apparatus presents a strong contrast to the noisy winding machinery generally adopted in South Staffordshire, and the absence of smoke, together with the apparent impossibility of colliers' lives being sacrificed by the negligence or oversight of the engineman in working his engine too long whilst men are ascending, seem to us to give to the improvement the importance which, now the new Mines Act is about to be put into operation, should attract the notice of the colliery people of this district.

Submarine Cable Manufacture.

A writer in a California exchange describes the manufacture of submarine telegraph cables in San Francisco, as follows:

The cable is made on one of Bowden Bros. horizontal cable machines, of twelve spindles, constructed at Newcastle-on-Tyne, England. The core consists of seven No. 22 copper wires, thoroughly insulated up to 5-16 of an inch in diameter, covered with gutta-percha and Chatterton's compound; over this is a layer of canvass and rope-yarn, measuring in all 9-16 of an inch; outside of this core are twelve No. 9 galvanized iron wires, each of which has a tensile strength of 1500 pounds. When finished, the cable is about one inch in diameter, and weighs in round numbers four-fifths of a pound to the foot. The gross weight of the cable and reel upon which it is wound, for the one length of two and a half miles, will be 13,000 pounds.

In making the cable, the core passes through the hollow shaft on the machine, and, meeting the wires at a central point, is covered by them. The twelve bobbins revolve around a common center, and the rope is drawn on to the reel by gearing attached to the reel. Considerable care is required to keep an exact strain on all the bobbins, for, if one wire breaks, the machine has to be stopped in order to join the ends.

This enterprise is, of course, as yet only in its infancy, but the proprietor hopes to extend his business ultimately to greater proportions. In fact, the main cause of its foundation is that they are in hopes of being able to make the China and other cables for the Pacific. The great danger to be apprehended in the transportation of submarine cable is from the change of temperature in crossing the tropics, as shown by the experience of the Red Sea and Panama cables. The only safe way is to lay it in large tanks filled with water.

Supporting Columns in Coal Mines.—The following petition is being circulated in the mining districts of Pennsylvania:

"*To the Senate and House of Representatives of the State of Pennsylvania:*

"Your petitioners, inhabitants of the State aforesaid, most respectfully represent that Governor Geary, in his last message, recommended the last Legislature to pass a law in accordance with the following paragraph:

"'A still more recent casualty suggests another amendment to the act referred to (of 1870). By the reprehensible practice of robbing the supporting columns, the roofs of the mines, the overlaying surfaces of which are in some places covered with houses, sink into the vacuum, causing the destruction of many thousands of dollars worth of property, as at Scranton, Hyde Park and Wilkesbarre. It should therefore be made unlawful to remove the coal supports without supplying their places with others of substantial masonry, or something equivalent.'

"Your petitioners do therefore pray your honorable bodies will pass a law in accordance with said recommendation, believing that many millions of dollars worth of property is at stake in mineral strata, such as iron ore and strata of coal above the nine feet vein, beside other minerals and valuable clays, together with houses, barns, orchards, timber, water courses, mills, railroads, canals, public highways, cemeteries and the general devastation of the fairest and richest portion of our great State. And your petitioners will ever pray."

The Silber Light.—An English inventor, a Mr. Silber, has lately made various improvements in oil lighting. Among other lamps to which Mr. Silber has applied his principle, are the side and masthead lights used on ships. He has perfected a covering for these lanterns which, while permitting the free outward passage of heated air from the flame, is completely impenetrable to water washing over it. Waves breaking over the side lights so constructed would have no power to extinguish the flame. The principle of construction of these ship lanterns is analogous to that adopted to afford protection against currents of air in the case of street lamps and railway roof lamps.

The London *Engineer* gives an account of an interesting experiment made with a com pound engine. The engine was of the annular type; the large cylinder, about thirty-five inches diameter, the inner cylinder about fifteen inches, the stoke of both pistons was the same, about five feet, the piston-rods both laying hold of the same crosshead, which was connected with an overhead beam. The experiment consisted in shutting the steam off from the inner cylinder and driving with the outer annular piston alone. It was found that the engine, then indicating the same horse-power as before, failed to drive the machinery at the proper speed, and it was not till the indicated horse-power was augmented nearly forty per cent., that the engine would do the work. On permitting the steam to find its way to the inner cylinder as before, the indicated horse-power fell to the original point, the machinery being driven at the proper speed.

A French inventor proposes to photograph despatches to microscopic fineness, and blow them through a tube sunk in the Straits of Dover. When arrived at their destination the despatches would be enlarged again. By this method long despatches could be sent about as cheaply and just as quickly as short ones.

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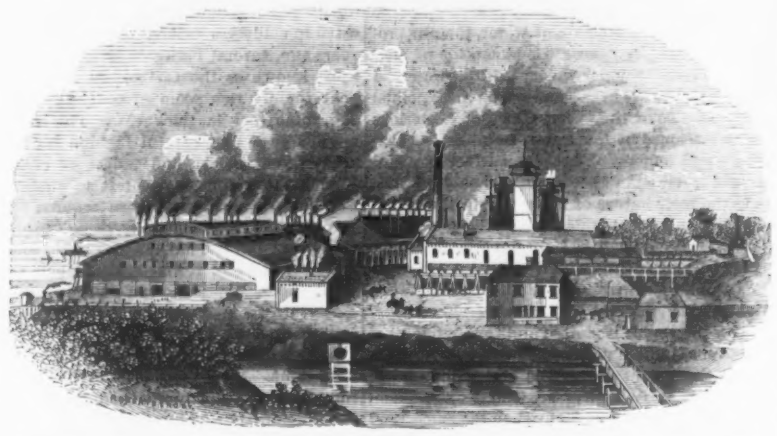

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of an unsurpassed excellence of quality at the lowest market rates. The long experience of the present managers of the Company, and the enviable reputation they have established for "CAMBRIA RAILS," are deemed a sufficient guarantee that purchasers can, at all times, depend upon receiving rails unsurpassed for strength and wear by any others of American or foreign make. Any of the usual patterns of iron rails can be supplied on short notice, and new paterns of desirable weight or design will be made to order. The Company are also preparing to manufacture Steel Rails by the Pneumatic process. Address

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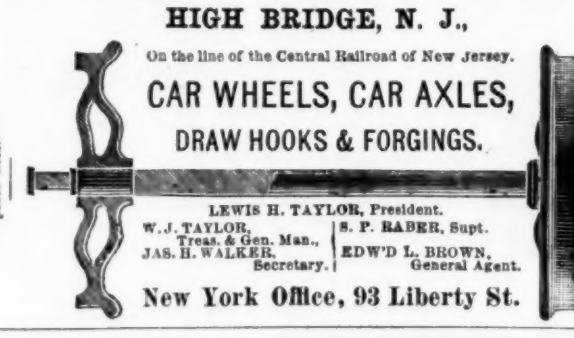

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Do High Wages Benefit Labor?

It has been charged that the high wages now paid to English workingmen in all trades have had the effect of rendering them idle, shiftless and intemperate. This has been stoutly denied by the unions, and the assertion has given rise to a good deal of newspaper discussion. We take the following from an interesting article in the Sheffield *Independent*, directly bearing upon the subject, and purporting to give the results of careful inquiry into the present condition of the working classes of that city:

Are the artizan classes any better off now, with their shorter hours of labor and their advanced wages, than they were four years ago? An answer either way would be strictly true. Many of the more highly remunerated men in the iron branches have taken advantage of the season of prosperity, and have been investing their savings, more particularly in building societies. As much cannot be said of the men employed in the cutlery, file, and other old staple trades of the town. It must, however, be admitted that during the season of extreme depression which followed the last commercial panic, the heavy discounts which were made brought wages down "almost to starvation point." It was with the utmost difficulty the barest necessaries of life could be procured. The advances, of which so much has been made, in the cutlery and other trades, would only have brought wages up to what were reasonable, even had the price of the commodities of life remained as they were. With each slight increase of salary men have had to pay far more for all they have had to purchase with it; and striking a balance, even on this account, they would be in no better position. It is true with a prosperous season of trade they might have worked more steadily and continuously; but they appear to have acted under the hallucination that because they were receiving better pay, therefore they were at liberty to idle away half their time and to live more extravagantly. So far as regards thousands of families in the town, the heads of which have been, and are, earning moderately good wages, they are scarcely a week's remove from pauperism. If overtaken by an accident or sickness they apply for relief at once. Employers who are no longer pressed with orders have begun to shake off the idle and incompetent, who are coming upon the rates. The opinion of those who are in a position to judge is that should a time of real depression of trade come there would be more poverty and distress in the town than ever were known before. Of course there are men in these, as well as in all other branches, who will save under any circumstances; but during the winter, even with augmented incomes, they have found it exceedingly difficult to do so on account of the increased cost of living. As regards the majority, they are as poor and as deeply in debt as ever they were.

Are the people of Sheffield any exception in their inveterate habit of borrowing and of putting off the evil day of paying as long as they possibly can? It is a significant fact that although wages have been steadily increasing, the business transacted by loan societies has also extended immensely. Some of these societies are inundated with applications from persons anxious to borrow; but only those who can offer satisfactory security are dealt with. A system of borrowing and lending is being carried on in some works to an extent little imagined. There are men in them all who are always poor, however much they may earn; and there are generally a few in each place who are as careful and as saving as the others are improvident. The one borrow from the other, the rate of interest being one penny per week for every shilling lent! Cases have occurred in which men have paid fivepence per week for months for the loan of five shillings. Those who are in the happy position of lenders are making a "good thing" out of it, and rather encourage the system. Good trade has in no way interfered with the business of pawnbrokers. In the County Court last year there were entered 21,504 plaints, and 5794 executions were levied. In the previous year there were 23,719 plaints entered, and 5579 executions levied. In fact, it is the old story. No matter what some people earn they will be poor and in debt. There are men in the town who are making from £5 to £10 per week who live in 4s. houses, and whose furniture, if brought under the hammer, would not realize £20.

What do the men do with their wages? Much of them goes in drink and in extravagant living; but there is another evil spreading amongst them to an alarming extent. The system of betting threatens to do as much in the way of demoralizing the working classes as even drink has done. There are large factories in in the town in which four out of every five men employed are addicted to gambling. From morning until night it is their one theme of conversation, and when any "event" is coming off little or no work is done. Frequently a man's week's wages are pledged before he has earned a penny of them. Twenty years ago only old stagers indulged in the habit, and in a very quiet manner. Those who have watched the development of this pernicious system in our large workshops trace it—whether rightly or wrongly—almost entirely to the establishment of local sports. Young men commenced by "backing" their shopmates, and encouraged by success, have proceeded to bet on more public events, until the system has engrossed the whole of their attention to the neglect of every other duty.

The relations existing between employers and employed in Sheffield at the present day are not of the most satisfactory character. Heads of establishments appear to be taking less and less personal interest in those about them. Men could be named who have been in the employ of a firm for twenty years who never have, and never would dream of, speaking to a principal The person with whom they have to do is the "manager," between whom and the men, in many instances, the most unfriendly feeling exists. The "manager" exercises his authority in an arbitrary and objectionable manner; and the men resent it by doing as little work for as much pay as they can possibly get. A steady, respectable workman, who is endeavoring to improve his position is regarded by the "manager" with jealousy, and his efforts are persistently thwarted and checked. Current events show very clearly what spirit is at work between employers and employed. Forty hammer drivers recently asked their employers to pay them full time, and not call upon them to suffer loss when from breakage or otherwise their hammers could not be worked. In reply, they were dismissed with a fortnight's notice, and their places were filled by others. Take a case on the other side. The razor grinders a few years ago were about the worst paid men in Sheffield. The trade was overstocked with labor, and men were altogether unable to provide properly for their families. By organization the men have succeeded in doubling their wages, and in so reducing their numbers as to make it altogether impossible for them to do the work required of them. Although they know their employers have not sufficient blades in stock to last a week, and that hundreds of pounds are being lost because orders cannot be executed, they refuse either to do more themselves, or to admit more than a certain number of apprentices into the trade. The men say they have too vivid a recollection of what they had to endure a dozen years ago ever to place themselves in the same position again. These cases sufficiently indicate the spirit at work, not alone, perhaps, in Sheffield. On the one side there is no personal intercourse and kindly sympathy; on the other there is no cordial, hearty service. It will be well for both sides if trade continue moderately good for some time to come, so that neither side might take advantage of the other.

It is said that a load of bullion came through from the Colorado Silver Regions as lead on to Philadelphia. At Wetemore siding on the P. & E. Railroad, the car that this metal was loaded on got jammed, and the metal was buried in the snow. Another car was procured, and the metal reloaded and sent eastward. Shortly after a peremptory order came from the president that seven bars of lead were missing, and they must be got. After considerable digging in the snow, five of the pigs were recovered and sent on. Then another order came, "the other two bars must be found," and found they were, after much delay and hard work. The men wondered why they were so particular about a few pigs of lead. But they found out shortly after that they were not lead, but silver, valued at $2000 a bar, being sent to the Philadelphia mint for coinage, and were carried in this way so as to mislead thieves along the road, who undoubtedly would have pilfered the car to some extent had they known the value of its cargo.

A few weeks ago, Messrs. Henry Rogers, Sons, & Co., of Wolverhampton, entertained their clerks and workmen to a splendid banquet, in the provision for which no expense and trouble appears to have been spared. At the conclusion of the repast, the senior partner rose and addressed the company to this effect: "The year just closing has been a year of marvelous prosperity. In that prosperity we have shared. We do not wish, however, to monopolize the whole of this good fortune. You, as faithful servants, are, we think, entitled to your proper share, and we have resolved to divide among you the bonus out of these extra profits in proportion to your salaries." The smallest bonus paid, was £5 to the errand boy. The total sum exceeded £500. This reminds us of Charles Dickens's inimitable sketch of the happy and benevolent "Cheryble Brothers." In the course of the evening Messrs. Rogers & Co. added to their kindness by promising everyone a week's holiday without stoppage of pay; and this piece of additional generosity called forth a hearty round of cheering.

A brief, but interesting, correspondence has passed between England and Austria to the following effect: A letter was received by the council of the Liverpool Chamber of Commerce, from the Imperial Austro-Hungarian Consul General, stating that his government was about to take measures to assist small manufacturers in competing with large establishments whose steam power and large capital menanced the existence of small traders, and asking if the English government had taken similar measures, or had power to do so. The council decided to send a reply to the effect that the proposed plan would in England be deemed an interference with commercial freedom and the legitimate advantages which were secured by the employment of capital and machinery.

A manufacturing chemist, Mr. John Carrington Sellars, of Birkenhead, England, has invented a novel composition of matter for use in the place of coal, cannel, etc., in the manufacture of illuminating gas. The composition consists of a mixture of sea-weed, sea-grass, sea-rack, or the like, with coal tar, pitch, bitumen, mineral oils, etc., either with or without peat, charcoal, or other carbonaceous matter, which mixed matter is subjected to destructive distillation in retorts. The advantages claimed are more effective separation of the light hydrocarbons; second, increased yield of carbureted hydrogen, and the production of coke particularly valuable in the manufacture of metal-founders' blacking.

M. Helouis proposes the introduction of a platinum bronze for the manufacture of cooking utensils. It is said to be entirely inoxidizable. The proportions are: nickel, 100; tin, 10; platinum, 1.

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And all other kinds below 6 inches

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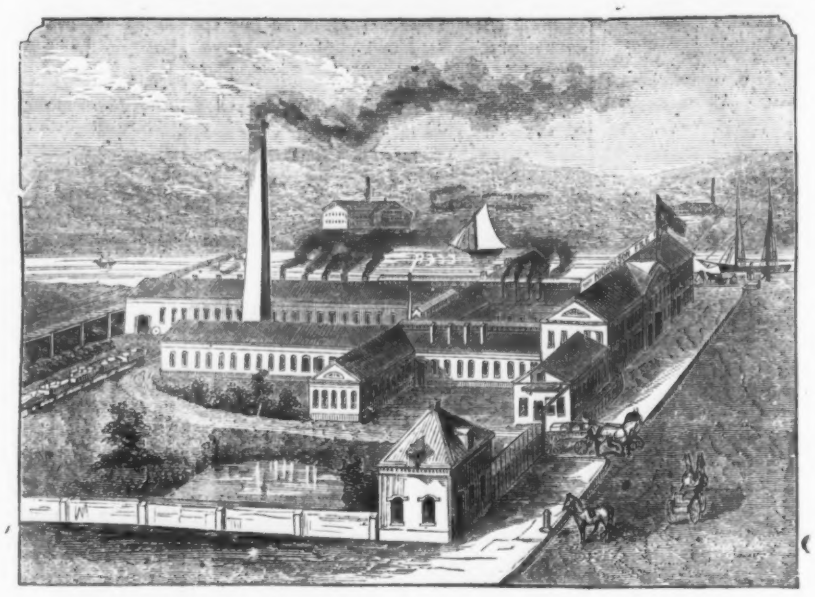

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"Waterville Cutlery Co.," Pen & Pocket Cutlery, Gooch's "I X L" Ice Cream Freezers,
"Bohannan's" Brass Switch Padlocks, &c., "Eureka" Counter, Spring Balances & Gro. Scales.

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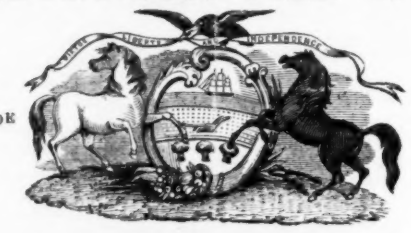
TRADE  MARK

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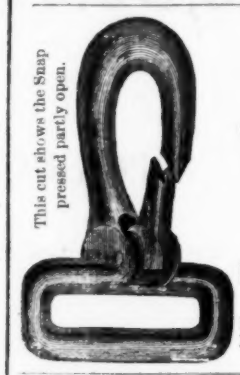

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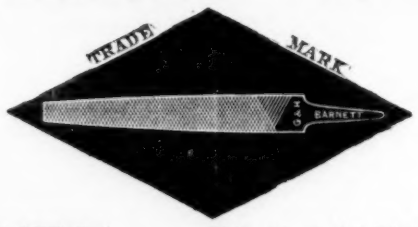

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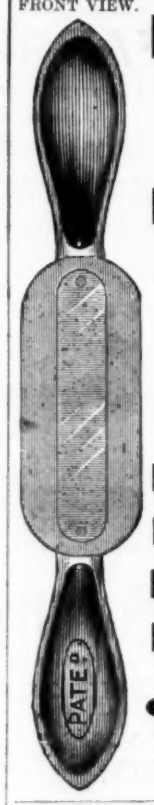

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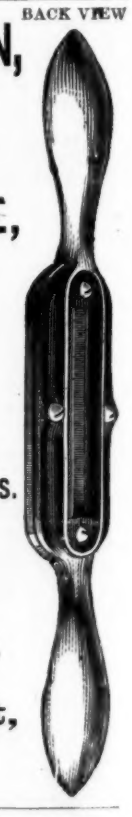

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BUSINESS ITEMS.

PENNSYLVANIA.

The Saucon Iron Company, in Hellertown, Bucks county, has $500,000 capital, employs 300 men, and pays to its workmen every month some $30,000.

The Phœnix Iron Company intend soon erecting an additional mill, at a cost of $1,000,000. At Bridesburg an iron mill is to be erected, and just opposite the built-up portion of the city, on Point Airy, there is soon to be established a smelting works for the reduction of lead and silver ores from the rich deposits in the Rocky Mountain region.

MASSACHUSETTS.

An order has been received at the Armory in Springfield to manufacture 4000 steel bayonet scabbards, and the work will be begun as soon as the machinery can be placed in position. This is a portion of a contract for a quantity of military accoutrements now being filled at the government shops at Watervliet, N. Y., where there are no facilities for manufacturing the scabbards.

Mr. S. R. Russell, of Boston, has invented an apparatus for extinguishing fires which works automatically, and promises to be of great value in case of fire. It consists of a number of turbine water wheels placed beneath the sidewalk in a house or store, and connected with the water main. It is worked by the pressure of the water, and connects with a powerful force pump, which pumps the waste water used in driving the wheel to any part of the building through a standing pipe, with which hose or perforated pipes around the ceilings may be connected. The entire machine occupies but four feet, and may be instantly set in motion by means of a lever, thus bringing water to bear on a fire the instant it is discovered. The machine is receiving the attention of the municipal authorities of Boston.

Messrs. Fearing, Rodman & Swift, East Bridgewater, manufacture all descriptions of chain cables, from ⅜ inch to 2 inch iron, turning out from 15 to 20 tons per week, which gives employment to 25 hands.

The Ames Company, of Chicopee, have contracted to build a bronze statue for a soldiers' monument in Chester, Pa. A fine set of recently finished gunstocking machinery is now shipping to an extensive arms factory in England.

A steam gong has been placed on the Wasson Car Company's works, at Brightwood, which is said to be the largest ever manufactured. It was made by the Water Meter Company, of Worcester, is 10 feet long, contains three separate bells, each of a different tone, and can be heard at a distance of 30 miles. In the new paint shop the company have a large force of men, and the cars are sent up from their old works in an unfinished condition and completed there. Their new engine and steam apparatus are to be tested soon.

CONNECTICUT.

"The Rugg Manufacturing Company" has been organized in Cheshire for the manufacture of edge tools and general hardware. The capital stock of $50,000 has all been taken at home. H. C. Ives is president and treasurer; Alfred Bristol, secretary; and Charles Rugg, superintendent. The latter has been for over twenty years foreman of the Collins Company, Collinsville. The company have bought four acres of land, and will soon build ample Works.

MAINE.

The Worcester & Nashua Railroad Company have contracted with the Portland Rolling Mills for 2000 tons of iron rail for the Rochester and Nashua line, now under construction, and which is designed to form the articulating link of the route between the extreme East, the city of New York and the great West.

OHIO.

The Columbus Revolving Scraper Company have erected a shop 120x30 feet, and two stories high, and now work from 25 to 30 hands. They expect to build a larger shop in the spring. They will make from 5000 to 8000 scrapers this year. They make from 100 to 150 dozen harrows per month, and about 100 railroad plows.

The firm of Schreyer & Smith, Columbus, manufacture the steel wagon skeins of which Mr. Schreyer is the patentee. The company is now erecting extensive works for the accommodation of its business. The new buildings are of brick, with a slate roof, and will be a great addition to the rapidly increasing establishments of the city. The foundry is 70x45 feet, machine shop 60x45 feet, two stories, forging shop 80x34, with an ell 50x40. The works will be fitted up complete for the purposes intended, comprising a rolling mill for rolling the plates used, six power hammers, beside binding and shearing machines, lathes, planers, etc.

MICHIGAN.

The work of rebuilding the Northern Iron Company's furnace, at Chocolay, has been suspended for a time on account of the the cold weather interfering with the mason work. A large share of the work necessary to make the change from charcoal to anthracite fuel has been done, and the furnace can be put into operation soon after open weather sets in. It is the intention to rebuild the docks and piers and dredge the channel at the mouth of the river. This will be expensive work. The rolling mill branch railroad, which is to be extended to the Carp furnace, should also be extended to the Chocolay, and thus furnish good transportation facilities at less expense than by the rebuilding of the Chocolay harbor.

The Marquette & Pacific Rolling Mill Furnace is being completely disemboweled, and will be remodeled after the style of the Grace stack.

NORTH CAROLINA.

The Iron Ore Hill Manufacturing Company, in Chatham, have commenced operations, and are making four tons of iron per day. They expect to have seven furnaces in full blast in less than 12 months, and will manufacture the article on quite an extensive scale.

KANSAS.

During the past year, the Lawrence Iron Works, at Lawrence, have run altogether 481 "turns," running all the time on "double turn," the mill being employed during the whole year, except for a short time in the summer. At their mill and coal banks they have employed about 300 men, and during the year have manufactured 7675 tons of muck bar, and 6014 tons of finished iron.

The contract for bridging the Missouri at Atchison was let on the 17th ult. to the King Bridge Co., of Topeka, for $815,000; the work to be completed in two years.

NEBRASKA.

At the Omaha Machine Shops, the Union Pacific Road has turned out the first locomotive, and expect to build them at that point in the future, as the cost is much less than at the East.

MISSOURI.

The Hamilton Iron Company are to erect a blast furnace in Blanton Settlement, in the northwestern part of Washington county, to be in blast by next July or August. The principal men of the company are experienced iron manufacturers from Portsmouth, Ohio, and their capital is $150,000.

Economy in the Use of Coal.

The council of the Society of Arts has issued the following announcement: "With reference to the sum of £500 placed at the disposal of the council, through Sir William Bodkin, by a gentleman who does not wish his name to appear, for promoting, by means of prizes or otherwise, economy in the use of coal for domestic purposes, the council have decided to offer the following prizes:

"1. For a new and improved system of grate suitable to existing chimneys as generally constructed, which shall, with the least amount of coal, answer best for warming and ventilating the room—the Society's Gold Medal and £50.

"2. For a new and improved system of grate, suitable to existing chimneys as generally constructed, which shall, with the least amount of coal, best answer for cooking food, combined with warming and ventilating the room—the Society's Gold Medal and £50.

"3. For the best new and improved system of apparatus which shall, by means of gas, most efficiently and economically warm and ventilate a room—the Society's Gold Medal and £50.

"4 For the best new and improved system of apparatus which shall, by means of gas, be best adapted for cooking, combined with warming and ventilating the room—the Society's Gold Medal and £50.

"5 For any new and improved system of arrangement not included in the foregoing, which shall efficiently and economically meet domestic requirements—the Society's Gold Medal and £50.

"The council reserve to themselves the right of withholding all or any of the above prizes, as the judges appointed by them may determine.

"The competing articles must be delivered not later than the 1st of December, 1873, with a view to their being tested, and subsequently shown in the London International Exhibition of 1874.

"Further particulars as to place of delivery and other arrangements will be published as soon as they are finally settled."

The Centennial Stock and the Pennsylvania Ironmasters.—The Committee on Rolling Mills, in connection with the Centennial Anniversary, composed of Samuel J. Reeves, George B. Newton, Stephen Robbins, and Percival Roberts, have issued an address to the producers and manufacturers of iron throughout the State, soliciting subscriptions to the Centennial stock. Appealing to the self interest of the iron workers, they say: "What class of our citizens has more to gain from an international industrial exhibition on our own soil and within the limits of our own State, than the manufacturers of iron? They have heretofore had a home market for all their products, but they should not therefore neglect to extend their foreign market. They should look abroad for customers, as England does to-day. An exhibition at Philadelphia of the world's industrial products would be most favorable for a display of the iron products and resources of Pennsylvania, and could not fail to increase the estimation in which they are held by foreigners, and eventually to increase the demand for any surplus of finished iron we might have to sell. The home demand for our iron would also be stimulated by a display which would convince thousands of Americans that home made wares are the cheapest and the best." They say that of the four millions promised by Senator Scott to come from Pennsylvania alone, so large an interest as that of iron should take at least one-tenth of that sum. They then give the following as the subscriptions thus far received: Phœnix Iron Company, and Clark, Reeves & Co., $5000; Cambria Iron Company, $5000; A. & P. Roberts & Co., 2500; Allentown Rolling Mill Company, $2500; John P. Verree, $1000; Seyfert, McManus & Co., $2500. The workmen in the iron establishments of Philadelphia have subscribed many thousands of dollars. In closing they urge promptness of response to the request for subscriptions.

Meeting of Copper Manufacturing Associations.—Representatives of a number of of the copper manufacturing associations of New-York, Massachusetts, Connecticut, Pennsylvania, Michigan and Maryland, met in annual session at Baltimore on Wednesday last. The business was conducted in private; but it is understood a resolution was adopted that no change be made at present in the price of manufactured copper, on account of the high price of the raw material.

Keystone Saw, Tool, Steel & File W'ks,

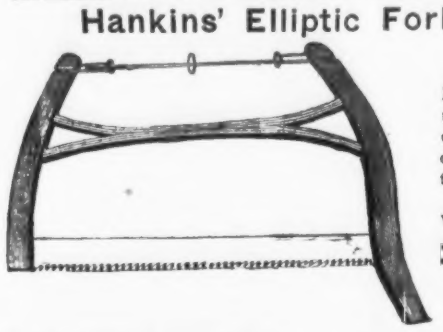
Front & Laurel Sts., PHILADELPHIA, PA.

HENRY DISSTON & SONS,

having rebuilt that portion of their extensive Works destroyed by the conflagration of Nov. 15, 1872, and having introduced new and improved Machinery for the Manufacture of every Article of the Trade, are prepared, with their increased facilities, to fill all orders with punctuality, promptness and dispatch.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



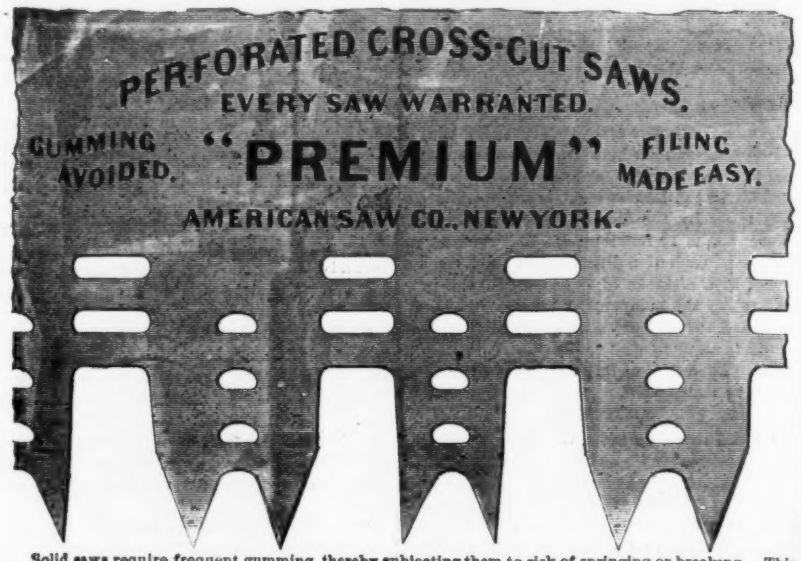
The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
VULCAN SAW WORKS,
WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

No. 1 FERRY STREET NEW YORK.



Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having *Patent Teeth*. In the perforated saws **all gumming is avoided,** and the teeth are easily kept long and in *proper shape*, saving *files*, *labor*, *expense* and *vexation*. As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

L. COES & CO.,

Manufacturers of

L. COES'
Genuine Improved
PATENT
SCREW
WRENCHES,

Worcester, Mass.

We have manufactured this style of wrench for the past two years. Our Mr. L. Coes, formerly senior member of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar *wider*, where the strain comes most severe, and screwing a nut up firmly against four *square* shoulders inside the ferrule, thereby *effectually* preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the market.

There are *Imitations* of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 10th, 1863 (re-issued June 1st, 1869), June 26th 1866, March 23d, 1869 (re-issued April 12th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped

"L. COES & CO"

Warehouse, 97 Chambers and 81 Reade Streets, New York.

HORACE DURRIE, Agent.

Parties ordering from the New England States can order direct from the manufacturers

L. COES & CO.,
Worcester, Mass.

WOODROUGH & McPARLIN,

MANUFACTURERS OF

PATENT GROUND

SAWS

OF ALL KINDS, INCLUDING

HAND, PANEL, BACK SAWS, &c.

CINCINNATI, O.

SEND FOR A CATALOGUE.

H. W. PEACE,

MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

LIVINGSTON'S
PATENT BRACED
WOOD SAWS,
Pat. BUTCHER & KITCHEN SAWS

Recognized Standard Goods for durability, quality and finish.

For sale by the Hardware Trade and

T. F. Cheritree & Co., New York.

Excelsior Saw Works.

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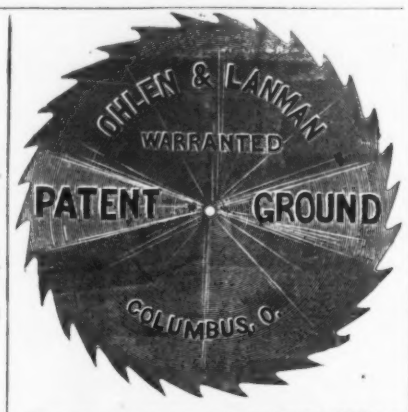
Manufacturer of

Superior Cast Steel Hand, Panel, Ripping, Ice, Compass, Hack, Butchers' Bow, Grafting, Pruning, Keyhole and Web Saws, Mowing Knives, Trunk Springs, And all other kinds of Springs, made from Sheet Cast Steel.

Capron's Improved Turbine
WATER-WHEEL.
POLISHED & DETACHABLE BUCKETS
CHEAPEST & BEST WHEEL MADE.
CAPRON WATER WHEEL CO. HUDSON N.Y.



We make a specialty of the LARGEST SIZES of **Circular Saws,** and call particular attention of lumber manufacturers to the following points of excellence:

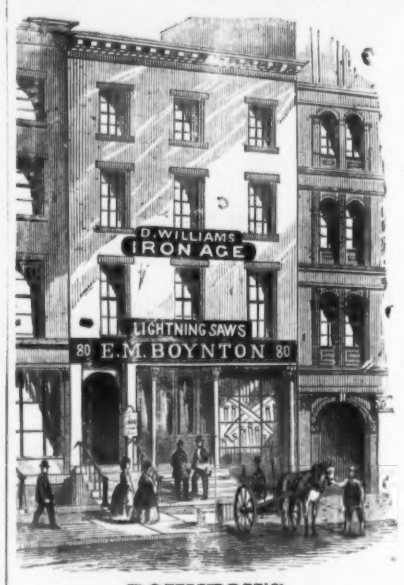
Evenness of Temper.—The peculiar structure of our furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—Our saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave our works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, can not be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of our Senior, who has devoted over *twenty years* to the art of saw making.

We are sole proprietors and manufacturers of the celebrated **"Clipper" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

JAMES OHLEN.



BOYNTON'S LIGHTNING SAWS.

Awarded the Medal of the American Institute, 1872.

Two Direct Cutting Edges, instead of one Scraping Point. Note extra steel and durability over the old V, outlined on M tooth.

A Challenge of $500, toward expense of a public test, to prove that the Lightning Saws excel all others in Speed, Ease, and Simplicity, has been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws were sold during the year 1872, the purchasers of which testify to their superior merits.

Our leading papers, such as the *Tribune, American Agriculturist, Christian Union*, etc., have published over sixty editorial notices recommending these Saws. Farmer's Clubs, Lumbermen, and Hardware Dealers unite in pronouncing the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws.

Where the Hardware Trade do not sell the Lightning Saw, I will send a 6-foot cross-cut and a buck saw blade on receipt of $6.

For Catalogue and additional information, address

E. M. BOYNTON, 80 Beekman St., New York,
Sole Proprietor and Manufacturer.

WHEELER, MADDEN & CLEMSON

Manufacturers of Warranted Cast Steel

SAWS

OF EVERY DESCRIPTION,

including

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CAST STEEL FILES

of the well-known brand of

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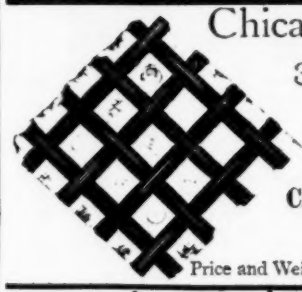
36 TO 48 DILLER STREET.

EVANS & CO., Proprietors.

OFFICE, 281 MADISON STREET, CHICAGO, ILL.



CRIMPED LOCOMOTIVE SPARK CLOTH
A SPECIALTY.

Price and Weight per Square Foot, by the Roll. For Steel Wire, add 7%

3 x 3 Mesh.			3½x3½ Mesh.			4 x 4 Mesh.			6 x 6 Mesh.			8 x 8 Mesh.			10 x 10 Mesh.		
No of Wire	Wt. per sq. foot	price cts.	No of Wire	Wt. per sq. foot.	price cts.	No of Wire	Wt. per sq. foot.	price cts.	No of Wire	Wt. per sq. foot.	price cts.	No of Wire	Wt. per sq. foot.	price cts.	No of Wire	Wt. per sq. foot.	price cts.
10	3.47	40	11	3.20	38	12	2.80	35	14	2.43	33	16	2.00	30	18	1.39	30
11	2.75	32	12	2.45	31	13	2.15	30	15	1.97	30	17	1.47	25	19	1.08	25
12	2.10	26	13	1.85	25	14	1.62	25	16	1.51	25	18	1.11	20	20	0.76	20
13	1.61	22	14	1.41	20	15	1.31	21	17	1.10	20	19	0.85	18			

These Cloths are used for Mines, Jail, Asylum, and Storehouse Window and Door Guards, Malt Floors, Bulkheads and Floors for Grain Elevators and Grain Vessels. SPECIAL FIGURES FOR LARGE ORDERS.

Brundage Forged Horse Nails,

Manufactured from

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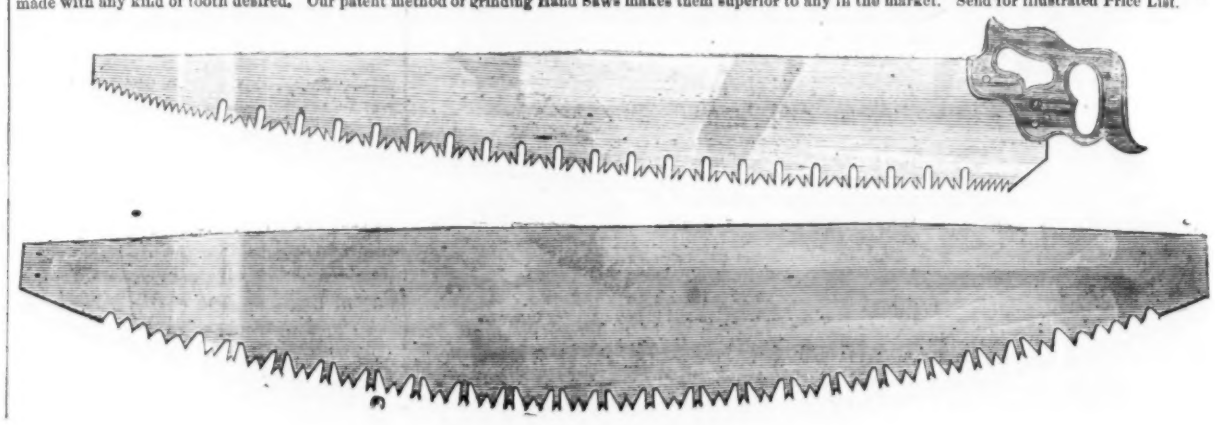
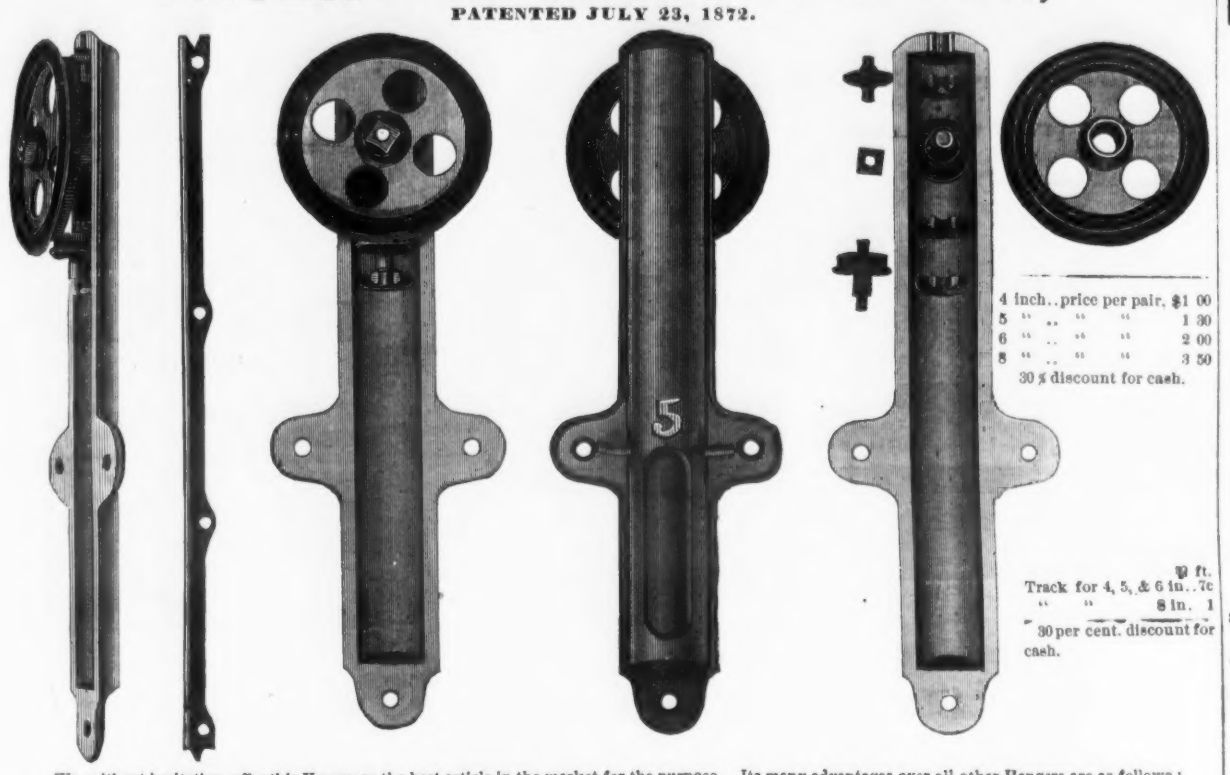
A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for illustrated Price List.



PATENT NOVELTY HANGER,

PATENTED JULY 23, 1872.



4 inch..	price per pair,		$1 00
5 "	"	"	1 30
6 "	"	"	2 00
8 "	"	"	3 50

30 % discount for cash.

	₩ ft.
Track for 4, 5, & 6 in..	7c
" " 8 in.	1

30 per cent. discount for cash.

We, without hesitation, offer this Hanger as the best article in the market for the purpose. Its many advantages over all other Hangers are as follows:
1st.—It is more than **double as strong** as any other Hanger, owing to its semi-cylindrical or curved back.
2nd.—It is provided with a friction wheel at the top of the Case, which bears against the rear or outside of the sheaves, and prevents it from **leaning outward** and causing it to **RUN TRUE,** a feature not attained in any other Hanger.
3d.—By thus causing the sheave to run true, the doors are always held up **Close to the Frame,** and maintain a close joint around it.
4th.—The sheave has but one flange, there being a lower friction wheel provided with a flange which extends out under the face of the sheave and bears against the outer side of the track, which takes the place of the extra flange in the sheave, thus doing away with the **grooved sheave** which always grinds or breaks.
5th.—**IT CAN NEVER RUN OFF THE TRACK.**
6th.—It is the **easiest running** Hanger made, our 5 in. answering the same as 6 in. of the checkback and ordinary makes.
7th.—It is the Most Complete Hanger, in its construction, being tasty, as well as durable.

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POCKET KNIVES,

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JAMES A. WHITNEY, Patent Agent and Expert, offers his service to inventors in securing **American and Foreign Patents,** as expert in patent cases, etc.

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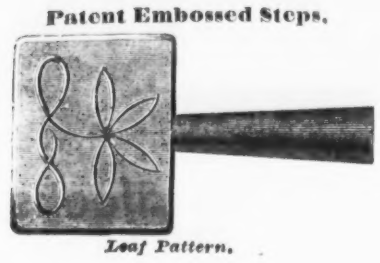

Leaf Pattern.

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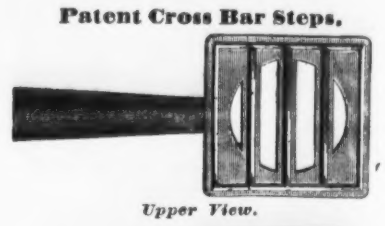
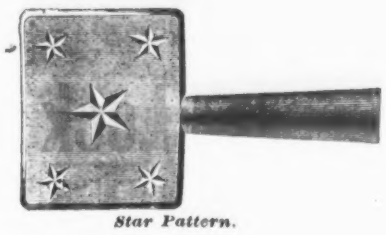


Upper View.

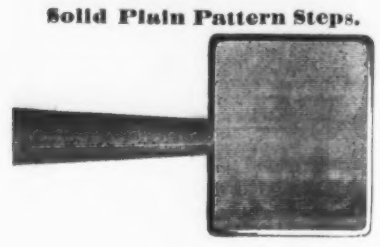
Lower View.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.

Solid Plain Pattern Steps.



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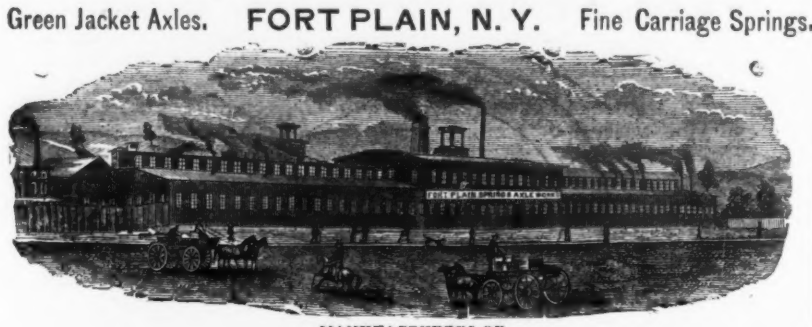

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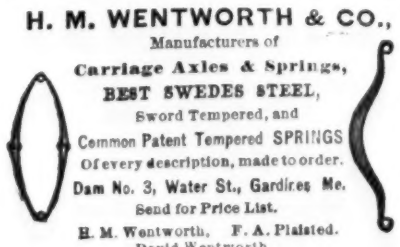

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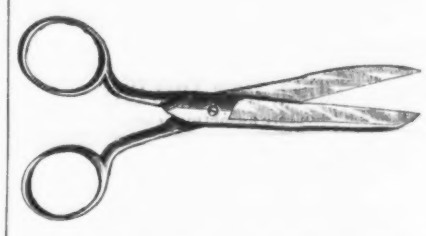

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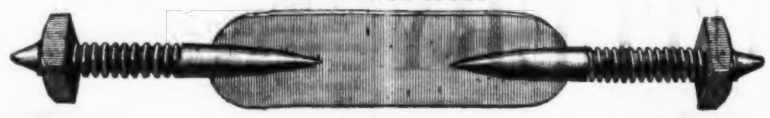

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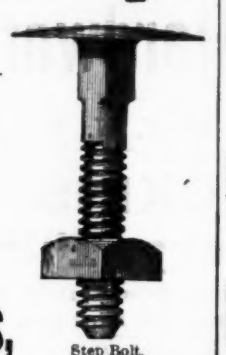

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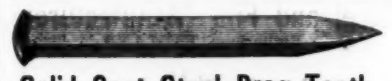

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CONTENTS.

The "Crystallization" of Wrought Iron.

Mr. Oliver Williams, Superintendent of the Catasauqua Manufacturing Company's Works, and a practical iron master of large experience in the manufacture of bar, tank and boiler iron, railway axles, etc., has sent us two very interesting specimens of inch square bar iron, showing the action of frost in effecting what appears to be a complete change in molecular structure. The specimens are accompanied by the following letter:

CATASAUQUA, Pa., March 5, 1873.

To the Editor of The Iron Age—DEAR SIR: As showing the peculiar action of frost on iron, I send you, by to-day's express, two specimens cut from different bars of iron rolled by us for nut iron. These specimens were first nicked with a cleft on one side only, and then broken under a hammer, at a temperature of about 20° Fahrenheit. At this temperature both specimens broke off short, showing, as you will notice, a clearly defined granular or steely iron fracture. The pieces were then gradually heated to about 75° Fahrenheit, and then broken, as before, developing a fine, clear fibrous grain. The two fractures are but four inches apart, and yet are entirely different. This is not a new thing in our experience, but I have never had the phenomena explained to my satisfaction, and I refer the matter to you, hoping it may provoke an explanation that will be of interest to the trade. Yours, truly,

OLIVER WILLIAMS.

A careful examination of the fractures shows a difference which is certainly remarkable. At one end the iron has broken short off with a fracture not unlike that of cast iron: at the other end with a fracture such as might be expected in good neutral wrought iron, while midway between them the bar is bent double, after clipping on one side, showing a fracture of beautiful gray color and exposing a continuous silky fiber, more resembling the fiber of hickory wood than anything else to which we can compare it. The questions suggested are: Is the steely, granular fracture really crystalline, or only apparently so because the plane of the fracture is at right angles to the grain? And, if really crystalline, is such molecular change the usual effect of frost upon neutral wrought iron?

Upon these subjects it is difficult to express any decided opinions, either based upon the results of original observations or upon the conclusions of those who, by careful and scientific experiment, have endeavored to settle the long disputed question of the crystallization of wrought iron. We have seen good neutral iron behave very differently at different times under much the same conditions, but nothing in our observation has led us to believe that fibrous wrought iron becomes really crystaline under any conditions. The contraction and expansion of a bar of iron, according to its temperature, necessarily implies a more or less constant change in the relation, or relative position, of the molecules composing it; and, when most contracted, the iron may become so compact that, when broken short off across the grain, it may appear to be composed of minute crystals, as in the samples before us. On the other hand, when the iron is expanded by heat, it is probable that the molecules are so adjusted as to develop much greater tenacity than when cold, and the fracture made under these conditions would naturally present a fibrous appearance. Robert Stevenson was, we believe, opposed to the theory of a change from fibrous to crystalline structure in wrought iron under any circumstances. Mr. Thorneycroft considered that the internal structure of iron undergoes no change unless there be a change of form, but that long continued bending would make the most fibrous iron crystalline. Mr. Roebling, the eminent bridge constructor, gave it as the result of his experience that the most fibrous bar may be broken so as to show a granular, and apparently crystalline fracture, without undergoing any molecular change whatever. "Take," he says, "a fibrous bar, 10 feet long, nip it in "the center all around with a cold chisel, "then poise the bar upon the short edge of "a large anvil and a short piece of iron "placed eight or nine inches from the edge "on the face of the anvil, and strike a few "heavy blows upon the nip so that each "blow will cause the bar to rebound and to "vibrate intensely, and the result will be "a granular and somewhat crystalline fracture. Now take up the two halves and "nip them all round again, about one or "two inches from the fractured ends, and "break them off by easy blows over the "round edge of the anvil, and the fibre "will appear again. This experiment "proves that a break caused by sudden "jars and intense vibration may show a "granular, and even crystalline, fracture, "without having changed the molecular "arrangement of the iron. All fibres are "composed of mineral crystals drawn out "and elongated or flattened, and the fracture may be produced so as to exhibit in "the same bar, and within the same inch of "bar, either more fibre or crystal. But a "coarse crystalline bar will, under no circumstances, exhibit fibre, nor will a well "worked-out fibre exhibit coarse crystals." We might quote a number of other authorities on this subject, but none of those which we now call to mind present any facts upon which the wide diversities of opinion above shown can be reconciled.

The question of practical importance involved in such a dispute, however, is whether such changes of structure as may take place during the contraction and expansion incident to changes of temperature, affect in any material degree the strength of iron. On this subject there is the widest diversity of opinion among recognized experts, whose views are entitled to the most careful consideration. As regards rails, experience seems to show that the results reached in actual service are different from those reached by experiment, as more rails and axles break in winter—mostly showing seemingly crystalline fractures—than in summer, while carefully conducted experiments have, under some circumstances, shown that very cold iron will resist a harder blow than the same iron when heated to the average summer temperature. Knut Styffe, the eminent Swedish metallurgist and Director of the Royal Institute of Stockholm, is of the opinion that "the modulus of elasticity "in both iron and steel is increased on re"duction of temperature and diminished "on elevation of temperature." He admits that his conclusions are at variance with what would seem to be the general experience, but accounts for the fact that iron and steel become brittle because sufficient allowance is not made for expansion and contraction incident to changes of temperature. Sandberg, an authority on railroad iron and translator of Styffe's works into English, reaches a very different conclusion. Wishing to ascertain specifically the effect of cold upon iron rails, he undertook a series of experiments extending through summer and winter, which are described as follows:

"A granite rock near Stockholm was leveled *in situ*, and upon this plane surface two cubic blocks of granite, each containing about ten cubic feet, were placed four feet apart to serve as supports. A ball weighing 9 cwt. was so adjusted that it could be raised to a hight of 15 feet, and then allowed to fall on the rail midway between the supports. All the rails were tested by the ball falling from a hight of 5 feet for the first blow, and with an increase of 1 foot for each succeeding blow, until fracture occurred, the deflection being measured after each impact. The average results obtained from ten rails showed that one end of a rail tested at 84° F. resisted a blow from the hight of 39 feet, whilst the other end tested at 10° F. only sustained a blow from the hight of 11 feet."

Notwithstanding the results of Sandberg's experiments, Styffe is not alone in the position he has assumed. Dr. Joul reached the conclusion, after careful experiments, that frost alone does not render iron or steel brittle under any circumstances; while Sir W. Fairbairn holds that the strength of wrought iron is increased by frost. Fairbairn considers Sandberg's experiments inconclusive and unsatisfactory, because made with notoriously cold short iron, but admits that they may, perhaps, be regarded as showing that cold short iron is weakened by frost, even if neutral and hot short irons are not.

The conclusion naturally reached from a comparison of these opinions, and a careful examination of the facts upon which they are based, is that the quality and chemical constitution of iron has much—perhaps everything—to do with determining the effect of cold upon its structure and strength. The subject is one of so much interest and importance that we are unwilling to venture any hastily formed or ill considered explanation of the phenomena which are brought to our attention in the letter above published, preferring rather to lay the matter before our readers in the hope of exciting discussion. The experiences of iron masters and engineers with regard to the crystallization, or other change of structure, in good neutral wrought iron, from frost, vibration, or other causes, would prove of great public interest, and we invite the fullest and freest discussion of the subject, promising as large a share of our space as may be necessary to accommodate such interesting communications as may be sent us.

The British Coal Famine.

Much as it has been written about by newspaper correspondents and dscussed by newspaper writers, we do not believe that any adequate idea has yet been formed by the people of this country of the miseries resulting from the scarcity of fuel for domestic purposes in Great Britain. Our English exchanges are full of such paragraphs as the following, which we take from a report of one of the London Health Inspectors: "It has come to my knowledge "that, owing to the present high price of "coals, many of the poor in the parish are "enduring great privations. In some poor "families that I have heard of fuel is "obliged to be economized in the following "manner: A fire is lighted early in the "morning to boil the water for breakfast, "after which it is put out and not re-lighted "until the time for cooking the dinner "(when they have any), when it is again "put out and not re-lighted till tea-time. "Surely, it will be manifest to every one "that, apart from the misery which the "poor, starving children of these families "have to endure, the effects of such privation upon their health must be very serious. At the best of times they get but a "scanty supply of nourishing food to cre"ate animal heat; and now, with the pres"ent low temperature, ill-clad and almost "without fires to warm them, it seems al"most too much to hope for that the "amount of animal heat necessary to sus"tain life can be very long maintained." But the suffering from this cause is not confined to those living in absolute destitution. It is stated that thousands of families belonging to what are known as the middle classes are compelled to practice the closest economy in the use of coal. Fires for heating only are very generally dispensed with, and during the unusually cold weather of the past winter many of the comforts, and most of the luxuries, of life have been sacrificed by those in moderate circumstances to admit of the purchase of coals enough to banish frost from their dwellings and render them habitable by persons unable to bear long continued exposure to cold. In other cases, where economy is not forced by poverty, it has been at times impossible to procure domestic coals at all, or at least in quantities sufficient to meet the requirements of families. The suffering and inconvenience from this cause may, however, be expected to diminish with the advance of the season, and perhaps the falling off in the demand for fuel for heating purposes will have a beneficial effect in somewhat reducing the price of coals needed for kitchen and laundry use.

But the evils of the coal famine do not stop with the suffering incident to insufficient supplies of fuel at prices which are beyond the means of the poor and which impose heavy burdens upon the middle classes. Dear coal implies increased prices for every useful commodity and for transportation on the one hand, and diminished employment for workingmen on the other. There is not one department of British industry which has not felt the paralyzing influence of the advance in fuel. With higher prices for manufactures of all kinds their consumption is restricted, and in many districts employers have been compelled to reduce the number of the men and women in their employ, and to reduce their productions as the only means of escaping otherwise inevitable bankruptcy. This has led to great privation and much suffering among the working classes in districts where coal is scarce. All these evils combined, and the enforced idleness of those who, not taking part in the ruinous strikes, are prevented thereby from pursuing their trades, have brought about a condition of affairs which, we think, may safely said to be without parallel in English history, and which presents a marked and painful contrast to that which existed during the season of unexampled industrial activity and general prosperity through which England so lately passed. Nor is the outlook encouraging. It is believed by many that coal, which at latest advices was quoted at 53 @ 54 shillings, or about $13 @ $13·50, gold, per ton, will advance to 60 shillings, or $15, gold, before the market turns; and while such prices cannot be maintained permanently, since they would paralyze the nation's industries and reduce its consumption to a minimum, there is no reason to hope that England will ever again enjoy the benefits of cheap fuel. We have it on the eminent authority of Sir William Armstrong, that Great Britain has reached the maximum of her production, and that, henceforth, her coal fields will not be able, under the most faxorable conditions, to more than supply what, under ordinary conditions, would be her present consumptive demand. This is a startling statement, since it admits that no material increase of consumption is possible unless foreign sources are drawn upon to make good the deficiency of home production. Under such circumstances, we see no chance for England to retain her monopoly of the export trade in manufactures in competition with this country. With dear coal and high wages, she cannot even hold her present position. The London *Times*, which does not speak on so grave a question without deliberation, sounds the note of alarm in the following language:

The maintenance of prices of coal such as we have been accustomed to, is the condition of our supremacy as a manufacturing nation. Cheap coal is cheap labor. The latent energy of coal, stored up for unnumbered thousands of years in our subterranean treasure houses, is the motive force of all our great manufactures. If we lose this, we are indeed forlorn. Why is it that raw cotton comes from the Southern States of America to be spun into the fabrics which are exported to the East Indies, the native home of the cotton plant? Why is it that wool is brought from Australia to England to be woven into the broadcloth that is sent back to Australia in the shape of ready made clothes? Why is it that tin from Banca, that copper from Chili and Australia, that sugar from the Antilles and the Mauritius, are poured into England in their rough and unmanufactured condition to be smelted and refined and adapted for use by those who require them? It is not because we have an unusual supply of labor. Other countries—Ireland, for example—have ample supplies of labor; and, indeed, the reserve supplies of labor are everywhere abundant, and are always forthcoming where there are means of employing them to advantage. We have developed supplies of labor for this reason, and for this reason only—that we have the means of setting it to work. We owe our position simply to this—that we have got at hand the piled-up natural force in directing which human labor is most efficiently employed, that the substance in which this force is accumulated is in itself so bulky and cumbrous that it is less toilsome to bring the raw materials to it to be converted into the finished product than to carry it to the place of production of the raw materials to manufacture them there; and it follows that if through the diminution of our store the basis of manufacture can no longer be obtained from our mines with the same facility as from other reserves, the homes of production will shift with the shifting cheapness of coal. The center of gravity of the industria world will always be found where the labor of appropriating the motive forces of nature is least. This is, at all events, the principle of migration of industry. Men cannot without some delay transport themselves in nations from one field to another, as the return they obtain for their industry varies; there is a good deal of friction impeding the migration of races; but the course of change always tends to pursue the bounty of Nature, and we can often see the ripple of the movement before the current has reached its full force.

What this means our readers can judge for themselves. The nation is profoundly alarmed at the situation, and more than anxious for the future. Mr. Mundella's motion, providing for the appointment of a commission to inquire into and report upon the present high price and scarcity of coal, has passed Parliament without opposition, and as promptly received the assent of the government; and it is to be hoped the forthcoming "blue-book" will contain something more than specious arguments and deceptive statistics, showing that there is still coal enough in the earth within British territory to supply the largest possible requirements of the nation for another century. This is probably true, but the question of practical interest now to be answered is, whether and under what conditions that coal can be mined so cheaply as to enable British manufacturers to hold their own for another generation against foreign competition.

The Labor Statistics of Massachusetts.

It is certainly to be regretted that the successful results which have attended the labors of the Board of Commissioners appointed to collect, classify and publish such useful information as can be gathered concerning labor, and the condition of the laboring classes, in Massachusetts, have not had the effect of impressing the legislatures of other States with the importance of making provision for the performance of the same good work in much the same way. The last report of the Massachusetts Commissioners, lately published, is of especial value and interest, and we would gladly give its contents a larger share of our space, but in the present crowded state of our columns we can only find room to note a few of the more interesting features of the work, which, with the reports that have preceded it from the same source, constitutes an important addition to our current statistical literature.

The most noticeable feature of the report is that which exhibits the diversification of industry under a protective tariff, and its natural minute subdivision. There are now as many as one thousand distinct trades and branches of trades employing labor especially skilled in their practice, and yet the number of occupations returned in 1870 was only 242. This is a distinguishing characteristic of our highly developed industrial system. The statistics of wages are interesting, as showing that skill and industry command for the working classes ample and comfortable support. The average annual earnings of each male above 16 years of age is $536, and each female above 15 is $237; and the wages of each youth or child employed under 16 is $150. The cost of living is estimated as follows, from actual returns, predicated on 5 2-10 persons to each family:

	Per Annum. Per family.	Per person.
Groceries and provisions	$258·58	$48·64
Vegetables	26·66	5·18
Clothing	134·07	25·67
Rent	76·78	14·98
Fuel	51·72	9·82
Light	6·31	1·19
Furniture	29·50	6·43
Education	12·00	2·28
Sickness	16·33	3·11
Recreation and travel	17·79	3·31
Charity	7·50	1·39
Religion	14·44	2·71
Society	6·50	1·25
Newspapers, &c.	8·74	1·67
Sundries	30·06	5·68
	$690·78	$122·33

These comparisons must be examined carefully before the conclusion is reached that the earnings of the head of an average family are not sufficient for its support in comfort. The returns for 1870 show that the average wages of males over 16 years of age $2·41 per day. If this be the average, a skilled and industrious mechanic, old enough to have a family of four or five to support, should earn at any good trade at least $3 per day and working 300 days in a year—which would give him 52 Sundays and thirteen holidays, he would earn $900, or $209·22 more than the estimated cost of living for a family of 5 and 2-10 persons. Suppose his expenses to be increased to $800, he would still have $100 left to deposit in a savings bank, and at this rate of accumulation he could easily save enough between the ages of 25 and 50, including compounded interest, to make more than ordinarily comfortable provision for his old age, or for the support of those dependent upon him in the event of his death or superannuation. In many trades three dollars per day is a low average for skilled and competent men, and it must be remembered that averages like those above given include all classes, and do not fairly show, so far as earnings are concerned, what the labor of a first-class industrious mechanic will command. They do show, however, that the average earnings of a head of a family will not support a family of five adults, whose maintenance costs as much as his own, and none of whom contribute anything to their own support, or the support of the others; but it is not to be expeeted that they would, nor is it desirable that the children of workingmen should, feel that they are exempt from the necessity of becoming self-supporting as early in life as possible. As the rule, however, the working classes are improvident and unthrifty, and there is no statistical warrant for supposing that increased wages have materially bettered their condition. A great proportion of the workingmen are perpetually in debt, and in many instances the vicious system of trading on credit leaves the workmen nothing for themselves on pay-day.

With regard to co-operation, the report states that, so far as Massachusetts is concerned, it has proved a practical failure, owing, doubtless, to lack of business knowledge and capacity, and the absence of reserve capital sufficient to tide the co-operative enterprises over unprofitable seasons. With regard to hours of labor, the report claims that the reduction from 12 to 11 in textile factories has resulted advantageously, and that the experiment of a Saturday holiday—working time 62½ hours per week—as tried by the shoe manufacturers of Lowell, Lawrence and Fall River, is said to have proved beneficial to both masters and operatives.

Steam on the Canals.

Since beginning the publication of the series of articles on Steam on the Erie Canal which appeared in recent issues of *The Iron Age*, we have received several letters requesting us to publish details of the trial trips of boats tested during the past two seasons, with tables of mileage, running time, fuel burned, &c. We regret our inability to comply with these requests.

The subject thus opened would be a broad one, and, as we are not disposed to make invidious discriminations, the privilege extended to one inventor of demonstrating by figures in our columns his claim to the State bounty, must needs be given to all who might choose to ask for it, and our space is limited. We have, beside, official warrant for believing that no boat entered for trial up to the close of last season succeeded in establishing an economy over boats towed by horses, all things considered, and if none succeeded it makes but little difference which boat did the best. There is, moreover, a difference of opinion as to which record makes the best showing, and in such reports as have been sent us we notice so much to suggest doubt, if not to invite disproof, that we could not do them justice without giving rise to what might become an interminable and profitless discussion. For the present the public are satisfied with the general fact that no boat yet tested has established a claim to the favorable consideration of the Board of Commissioners appointed under the act of 1871, and that, unless the Legislature shall extend the time for experiments, the coveted $100,000, which so many inventors have already promised to divide with those who have furnished them capital, will remain securely locked up in some strong box in the State Treasury.

The Profit of Gold Mining.

The question of whether gold mining pays in the long run, is not a new one, but those who have asserted that it does not have usually supported their assumption by the most general and inconclusive arguments. A sample of this kind of reasoning is found in a paper lately read before the Farmer's Club of Oakland, Cal., by Dr. E. S. Carr, who affirms that every dollar of gold mined has cost a dollar and a half to mine it. Dr. Carr estimates that 50,000 men are engaged in gold mining in California alone, producing $20,000,000 in 1872, and the labor of these men at $2·50 per day is worth $37,500,000 in a year. From this he reaches the conclusion that the difference between the value of the gold product and the value of the labor employed in producing it represents the net loss resulting from gold mining. The error in this reasoning is apparant. Of the 50,000 men engaged in gold mining in California about 23,000 are Chinamen, whose labor does not possess a market value of $2·50 per day. Of the remaining 27,000 it is probable that not more than 25 per cent. employ their entire time in gold digging, and to the value of the gold product must be added the wealth annually created by the opening of new and productive sections to settlement, by increased trade and transportation, and by the growth of towns in mining districts. It is chiefly, if not wholly, because of gold mining that California has become a great, populous and wealthy State within the memory of the present generation, and to make the showing a fair one, a very large part of her accumulated wealth and annual production must be added to the $20,000,000 which represents the yield of her gold mines. We do not believe that gold mining adds as much to the national wealth as iron mining in proportion to the capital invested and labor employed, but both are useful productive industries, and neither cost as much as they return.

The Thermometrical Averages of Past Winters.

The following table, compiled from the records of careful and accurate daily observations of the thermometer for a series of years, will be found interesting. We omit fractions of degrees in the monthly and general averages, adding one for all fractions above one-half.

	Monthly Average.			Average per month.
	Dec.	Jan.	Feb.	
1864	—	26	26	26
1864- 5.....	31	20	25	25
1865- 6.....	32	21	27	27
1866- 7.....	29	20	32	27
1867- 8.....	26	22	18	22
1868- 9.....	26	30	29	28
1869-70.....	30	33	26	30
1870-71.....	29	23	34	29
1871-72.....	26	25	25	25
1872-73.....	23	24	23	23

From this is will be seen that the past winter, so far as New York is concerned, has averaged much colder than any winter since 1864, with the single exception of that of 1867–8. This fact is quite in accordance with the average experience of the past season, and there is much cause for congratulation in the fact that the season of snow and ice, of obstructed travel and general discomfort, is so nearly over.

The Sheffield *Telegraph* says: The demand for coal in Sheffield, both for manufacturing and household purposes, is extraordinary, the colliery proprietors and agents having orders on their books which will take them some weeks to execute. So urgent in fact are the requirements of the public, that many firms have determined to reduce the pressure upon them by raising the price 1s. 6d. per ton to all but their regular customers.

CORRESPONDENCE.

Iron Ores in the James River Valley, Va.

LYNCHBURG, VA., March 8, 1873.

To the Editor of The Iron Age:—As you take a lively interest in whatever relates to the increase and development of the great industry of which your journal is the representative, I desire, through your columns, to direct the attention of iron manufacturers to the supply of iron ores to be found in the James River Valley. The magnetic and brown hematite ores are the most abundant, and are to be found in immense quantities a short distance from this city, and within easy reach of the canal or railroad. There has been but little demand for these ores hitherto, and consequently they have been but slightly developed, though sufficiently so to establish the great extent and value of the deposits. These ores are of excellent quality, easily mined, and accessible to transportation by both rail and water.

There are but few iron works of any description in the James River Valley. Richmond and Lynchburg each have several foundries and rolling mills. Between this city and Richmond there are but two furnaces, and one above here now in operation. Of course, the present demand for ores is very small, and, in consequence, the price is low. Contracts may now be made with responsible parties to mine and deliver brown hematite ore on the bank of the canal for $3 a ton. Magnetic ore would command something more. To any parties who may desire to invest in such iron properties, either for the purpose of erecting works or for mining the ores, this valley affords great attractions. The extension of the Chesapeake and Ohio Railroad down the James River Valley (which must be completed at an early day) will bring these iron ores within easy and cheap connection with the coal of the Kanawha Valley. The time is not distant when the iron properties of this valley, which can now be bought for such trifling sums, will be among the most valuable in the country.

Our people have neither the means nor the practical knowledge to embark extensively in such undertakings, and are looking abroad for those who will come and reap the harvest. As an indication of the interest felt by the city of Lynchburgh on this subject, I send you with this a copy of a pamphlet (with large inclosed map of Virginia), entitled "Resources and Advantages of Lynchburg, Va., and tributary country, prepared and published by order of the city council of Lynchburg." I will also send a copy of this pamphlet to any one interested in this subject, who will write to me for it.

I will further add that our city council has adopted an ordinance exempting from taxation by the city, for ten years, all capital employed in new manufacturing enterprises.

W. B. ROBERTSON.

Scientific and Technical Notes.

Mr. Henry Elbreg, of Terre Haute, is now exhibiting at St. Louis a working model of

A NEW COAL MINING MACHINE.

It is run by compressed air, and requires the attention of only two men. It moves automatically on rails, and does the work known as "cutting under," and makes a groove only two inches wide. As operatives with the pick cannot work to the required depth without making a breach of eighteen inches, it saves a large percentage of coal from being worked into slack. The price of a full sized working machine is $600.

Experiments have recently been made by Capt. Treve, at the Brest Foundry, France, on

THE EFFECT OF MAGNETISM IN CASTING STEEL,

which have determined that a condensation of the metal takes place under such circumstances, the grain becoming finer and closer. The mold in which the steel was cast was a large coil of stout wire, through which the electric current from a dozen Bunsen couples was passed during the whole period of cooling. But steel thus magnetised is found to be weaker than ordinary steel against tensile and crushing strains; and it is therefore suggested that means should be taken to protect cast steel from terrestrial magnetism during cooling.

Among the novelties which we glean from English scientific journals is

A THREE CYLINDER ENGINE,

in which the three cylinders are disposed round the crank-shaft at an angle of one hundred and twenty degrees to each other, each cylinder being provided with a deep but light piston, from which a connecting rod is led to the crank common to all. One of the connecting rods has a single eye at the crank end, while the two other rods are forked at that end, the fork of the one being wide enough to take hold of the pin outside the other, so that the center lines of the rods are all in the same plane. The cylinders are all open at their ends, and when the engine is at work the steam from the boiler has free access to the central space, so that it tends to force the three pistons outward uniformly. The admission of the steam to and its release from the outer ends of the three cylinders is effected by a single revolving slide-valve, which works against a face at one side of the central chamber, being carried around with the crank-shaft. As there is, necessarily, some throttling in the steam passages, particularly when the engine is running fast, the pressure of the steam at the outer ends of the cylinders never equals that in the central chamber, and hence the pistons are always forced outward.

A very interesting invention, lately developed by Mr. Brownell, of Hartford, relates to the

PLATING OF METALS WITH NICKEL, GOLD OR SILVER.

He puts a thin plating of nickel or gold and silver to other metals, and then melts it in, so that, while the surface is of the color and character of the plating, the latter so permeates the main metal that it neither scales nor wears off. Nickel applied to the linings of boilers, to the sheathing of ships, to the coating inside and out of gun and pistol barrels, prevents oxidization, lime incrustations, or any detrimental soiling, while it keeps the surface smooth, clear and bright. The expense of this method of plating is only a quarter of one per cent. additional; and if, as seems quite certain, it proves practicable on a large scale, this mode of coating coarser metals with finer will find new and larger applications.

The *American Gas Light Journal* says that a course of experiments has been instituted by two Italian investigators, to determine

THE EFFECT OF DIFFERENT COLORED LIGHT UPON RESPIRATION.

The animal to be experimented upon was placed in an air tight box into which no light could penetrate except such as passed through glass of a given color. Air freed of carbonic acid was constantly admitted into the box, and escaped by a second opening, where it was passed through a vessel which contained some absorbent of carbonic acid, so that its amount could be accurately determined. Representing the quantity of carbonic acid respired by a dog in a given time, under white glass, by 100, the amount given off under black glass was 82·7; under violet, 87·73; under red, 92; under blue, 103·77; under green, 106·03; and under yellow, 126·83. The difference was still greater when the experiment was tried on a pigeon and on a hen. The authors came to the conclusion that green and yellow rays, which are the most important to the vegetable kingdom in taking up carbonic acid, are also most favorable to the respiration of animals—that is, enable them to give off the most carbonic acid.

A very valuable invention for

ECONOMIZING FUEL

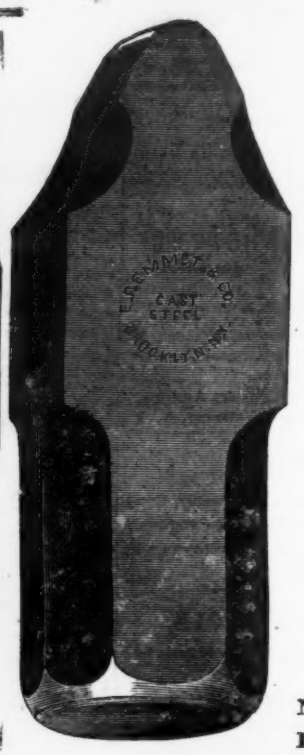
is described in the Sheffield and Rotheram (Eng.) *Independent*. It consists of a system for intensifying the heat of the heating furnaces employed by the steel making, tube rolling, and similar manufacturers, by the introduction of steam into the fire through brick chambers in solid bottomed grates. It has recently been adopted throughout Yorkshire, Lancashire, South Staffordshire and London. At the Earl of Dudley's iron works, in Staffordshire, a furnace has now begun to be used by which a saving of fuel to the extent of 10 cwt. to 13 cwt. upon every ton of iron produced is effected. Eight "heats" are brought out in the time usually consumed in making six heats. This is made possible by the adding to the furnace a heating chamber, in which the pig iron intended to be puddled is heated by the flames of the furnace on their way to the stack. At the same time that the consumption of fuel is reduced very considerably, the "yield" of puddled iron is considerably increased and the quality improved.

An important

IMPROVEMENT IN THE MANUFACTURE OF IRON SAFES,

is said to have been made by Mr. J. F. Elwell, of Birmingham. The body is constructed of solid Staffordshire boiler plates, varying from a quarter to three-quarters of an inch in thickness. These plates have dovetails cut out all round the edges by the steam shears. They are then united into the square of the safe, and the dovetails are hammered out into a spread form. Beneath these dovetails, running all round inside the body of the safe, is strong angle iron, which is riveted through to the plates. The back is united in a similar way, therefore the whole of the body is dovetailed together. The deep chamber inside is filled with a mixture, in certain proportions, of sawdust and a chemical vaporizing compound. This renders the safe entirely fire-proof, the theory being that immediately the outer plates of the safe become red hot, this chemical liquifies, wetting the sawdust and giving off a vapor through the interior of the safe, rendering the whole contents uninflammable. Mr. Elwell's patent principle for securing safety is very simple. It is merely a series of butt hinges, made of best malleable iron, of great strength. Half the hinge is secured to the door, and the corresponding half to the body of the safe. As the door closes these hinges (or "lugs") close into each other, and by one turn of the knob as in any ordinary safe, a steel bolt 6 inches long, ⅞ths of an inch diameter, is shot through every lug, these bolts being fixed by turning the key of the patent loek, which acts on the stop of the throws. Thus the safe is immovably pinned together all round. Instead of the bolts depending on the body for strength, as in all previously constructed safes, they give strength and solidity to it. It is evident that to pry or force the sides, top, or bottom would simply be an impossibility, as the wedge, the crowbar, and all lever force is entirely deprived of action. The doors are made of two solid boiler plates, of great strength, intersected with a chilled steel plate throughout, rendering them drill proof. The "lugs" are fastened to the door and body with an amount of strength which would resist almost any amount of force were it possible to apply it to them, and none of these fastenings come through the outside.

Special Notices.



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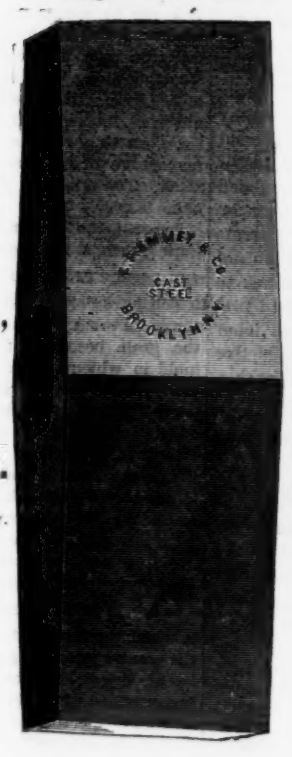

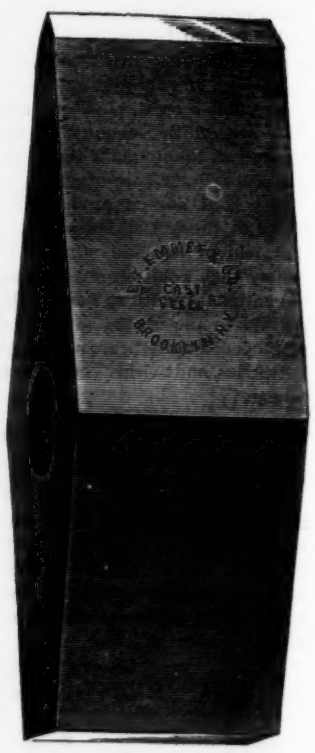

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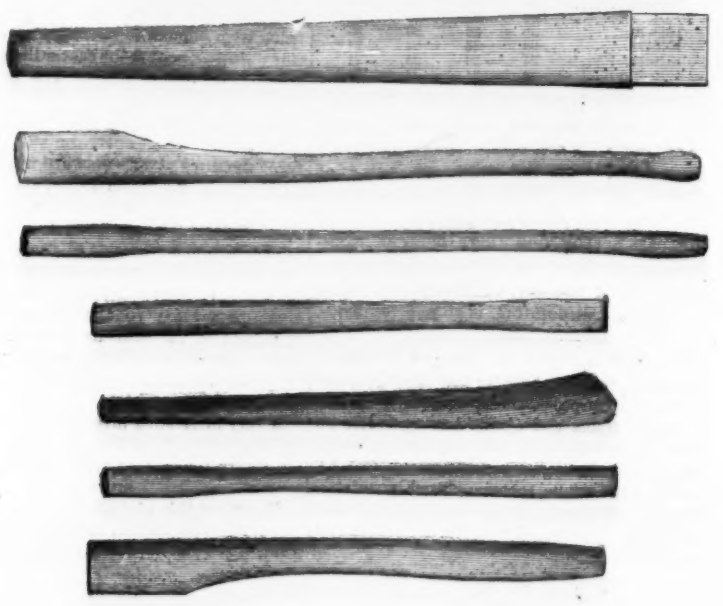


Our English Letter.

Review of the British Iron, Hardware, and Coal Trades.

(From our Special Correspondent.)

SHEFFIELD, February 18, 1873.

If you have any spare poetic genius, or superabundant talent, on your side of the Atlantic, I would recommend that it be instantly employed in the composition of a soul-stirring parody on the well-known lines—"Water, water everywhere, and not a drop to drink"—said parody to have *coal* for its theme. You cannot possibly conceive how popular such an embodiment of universal sentiment would be. I am afraid you don't appreciate roaring coal fires in the States You have never known what a cheerful blaze coals at 52s per ton will give out, and I am afraid you will never sufficiently approve my truthful candor, when I say that we Britishers feel a glow of warm feeling and cheerful pride in contemplating the proudly-recorded fact that our coals are to be found in all quarters of the globe. Does it matter one jot to us that our own poor are starving, really starving, because they cannot get fuel at reasonable prices? Not at all. If British commerce be extended and upheld, and free trade be scrupulously observed, what matters it? Obviously nothing. We have an immense surplus population—and, as a matter of course, the poor must *expect* to go to the wall first—so says the rich coal owner and money-making coal merchant. With the general public it is different, and, further, it is becoming desperate. In London the recent great advances are most seriously felt. Coals are being sold there now at from 42s. (lowest price) to 50s. per statute ton of 20 cwt. Derbyshire and South Yorkshire coals realize the average figures, and Wallsend, which professedly comes from the Newcastle district, commands the top price. Some people, I think rather too strongly excited ones, think that £4 per ton will yet be reached on the London Coal Exchange, and assert that orders can hardly be booked under £3 for future delivery. I must beg to differ from these pessimists. It would pay at £3 per ton to import French, Belgium, or even American coals—in fact, it is rumored that some capitalists have already arranged to import very heavy quantities from Belgium. The medical officer for the Marylebone district—not, I may say, one of the poorest in London—in his health report, says that, owing to the present high price of coal, many of the destitute poor are enduring great privations. He says that "at the best of times they get but a scanty supply of nourishing food to create animal heat, and, with the present low temperature, ill-clad and practically without fires to warm them, it seems almost too much to hope that the amount of animal heat necessary to sustain life can very long be maintained." Poor people are driven to desperate measures. Some have stolen fuel, and when brought up at the police courts have told honest straightforward stories, which have moved the representatives of the blind goddess to reduce the penalties to the lowest possible figures. In Lancashire the cotton trade is beginning to be seriously affected, and in some of the iron districts the price of fuel tends to greatly limit transactions. In the North of England some 300 puddling furnaces are this week being damped out, that number being equal to one-seventh of all the puddling furnaces in the district. One of the leading collieries near Sheffield is sending every ton it produces into Egypt, and another firm, not far from this town, are said to be *clearing* over £120,000 per annum! Report speaks—and I hardly doubt its credibility—of profits of over one million pounds sterling made last year by a nobleman who has the good fortune to be a mine owner! At Jarrow, on Wednesday last, Messrs. Palmer blew out one of their blast furnaces, it being impossible to work it, save at a considerable loss. The railway companies suffer pretty heavily by this impost. Last week, the chairman of the South-Western Railway Company, speaking at the half-yearly meeting, said he "began to think that coal was perfectly a luxury. The increased prices would cause considerable embarrassment to various trades and manufactures, and great privation to the lower classes. If some check could not be put on it, millions of persons must be thrown out of employment. If ever there was a case for government interference, this was one. If this state of things was allowed to go on, the prosperity of the country would be destroyed." Most people would indorse this opinion, if asked. An export duty appears to be the most feasible remedy, but it is thought that this country is, by its commercial treaties, precluded from imposing any such duty until the expiration of the treaties in 1876. If this be so, and I believe I am correct in saying it is, it behooves the government to take some steps in the matter. I am afraid, nevertheless, that Mr. Gladstone is far too deeply engaged in cleansing what he vainly imagines to be the Irish augean stable of "religious inequality," to be touched by the actual and heart-rending misery existent within three miles of his London residence. At Nottingham a mass-meeting of workingmen has been called to consider the alarming increase in the price of fuel, coal having gone up 2s. or 3s. per ton in one week. On Saturday last, Mr. Philip Casey, one of the secretaries to the South-Yorkshire Miners' Association, which numbers some fourteen thousand or fifteen thousand members, spoke at Sheffield, and, as his remarks are *apropos* to the subject, I give them at some length. He observed that in 1868 he was receiving 11¼d. per ton for coal produced, and had to pay his own filler and trammer out of that amount. Since that time, he believed the miners had got something like 37½ per cent. over that sum, and the total advance had been about 50 per cent., or 1s. 6d. per ton. He wanted those present to understand that it was not the miners who had got such exhorbitant advances on coal. The advance gained by the miners was something like 6d. per ton, and if 1s. per ton was added for the other men, he fearlessly asserted that that would cover the advance the colliers had received in this district. It was reported that the miners were making 10s. a day, and no doubt some were making that sum, but many were making a deal less, and when coals had been advanced from 4s. 6d. or 5s. to 15s., 16s., and £1 per ton, at the pit mouth, the coal owners must be getting the lion's share. The coal supply was not equal to the demand, and, in consequence, the owners had been able to push it up to its present price, and they could scarcely wonder at it. The demand had been so great that venders had offered 4s. per ton over the published price if the coal-owners would supply them, and they said, "We should be foolish if we did not accept it." The colliers of this district had had an advance of 37½ per cent. per ton; but 37½ per cent. upon 1s. or 1s. 4d. per ton was very different from 150 per cent. upon 5s. or 6s. per ton obtained by the coal owners. Those present must not be surprised if the colliers "went in" for another advance, in a week or two, for they believed it belonged to them, fairly, and they ought to have it. It was not the increase in the wages of colliers that caused the present high prices. It was a fearful thing to think that 50s. per ton should be paid for coals in London, when they cost £1 per ton at the pit mouth, and the carriage was 8s. per ton. The coal merchants of London realized a profit of £1 per ton upon all they sold; and he ventured to state that such a thing was monstrous. It was a position in which the combination of circumstances had placed these men, and they were doing their utmost to make the best of it.

The following figures will enable you to form some idea of the export coal trade of the United Kingdom: They presented some dimunition in January, having amounted in that month to 799,227 tons, as compared with 842,328 tons in January, 1872, and 559,690 tons in January, 1871. In these totals France figured for 206,217 tons, against 253,630 tons and 105,677 tons respectively; but the exports to Germany in January were only 40,174 tons, against 36,836 tons and 21,880 tons respectively. The exports increased in January to Sweden, Denmark, Germany, Holland and British India; but they decreased to Russia, France, Spain, Italy and Brazil. The value of the coal exported from the United Kingdom in January was extraordinarily heavy, being £834,508, as compared with £469,628 in January, 1872, and £280,671 in January, 1871. In these totals France figured for £205,235, £124,103 and £47,341, respectively.

In Northumberland there are 164 collieries, and in Durham 140, a total of 304. In 1871—the returns for 1872 not being yet available, these pits sent out 29,190,916 tons, which was thus disposed of: Coal exported to foreign countries, 6,330,567 tons; coke exported to foreign countries, 289,314 tons—computed as coal, 482,190 tons; coal sent coastwise, 5,355,737 tons; coke sent coastwise, 19,035 tons—computed as coal, 31,675 tons; coal carried from these coalfields by railway, 6,227,002 tons; coke carried from these coalfields by railway for local and land sale, 2,161,020 tons—computed as coal, 3,601,700 tons; coke carried south of Alnwick, 1,182,160 tons—computed as coal, 1,970,266 tons; coal and coke for railway use, the coke computed as coal, 591,779; colliery consumption estimated at 1,450,000 tons; domestic consumption and coal used in local manufactures, 3,250,000 tons; total, 29,190,916 tons. It will thus be seen that the requirements of foreign countries absorb more fuel than any other source of demand. Coal sent coastwise is another formidable item, the metropolis being the chief consumer. From the Tyne alone, in 1871, 2,354,218 tons of coal were forwarded to other parts of the empire, while Sunderland sent out 1,667,951 tons. When the returns for 1872 are issued they will, doubtless, show a very large increase even upon these bulky figures, which help to demonstrate why it is that the supply has so suddenly fallen below the demand, causing the present famine prices.

The Welsh strike is somewhat more shaky than when I last wrote you. Yesterday (Monday) morning, the 4000 men employed by Messrs. Brogden, at Llyndi and Ogmore Works, resumed work, terms being that the men work at a five per cent. reduction until March 1st; from March 1st to March 29th, at the old rate of wages; and from March 31st to July 5th, at five per cent. advance upon the December rate. This, as a matter of course, in no way effects the other iron masters, but, as a precedent, I expect to see a pretty general movement in the same direction. On Saturday, 8000 pounds were brought into Merthyr by the agents of the miners' union, but that sum, when divided amongst so many, is a miserable pittance. The London trade council, the South Yorkshire unions and other trades organizations, support the men, but it may be judged how bad is the case, when I say that of 10,000 miners who struck only 7000 were unionists, and of 50,000 iron workers only 3000 were entitled to support from the amalgamated association of iron workers. It is saying a good deal for the men, when it is recorded that they, disorganized as they are, have been able to "stand" a five weeks' strike. No doubt your daily papers have given full and exhaustive reports of the struggle, in which belief I shall confine myself more particularly to its business aspect. At Cyrfarthfa the furnaces are damped out; do. at Dowlais; Plymouth and Penydarran are quite inoperative; Blaenavon and Aberyschan are utterly deserted, and the other larger works—such as Blaina—are doing nothing at all. Little or no trade is being done in South Wales, except in coal and tin plates. From Newport (Monmouthshire), in January, 19,639 tons of coal were exported foreign and 42,377 coastwise. The iron exports were these: 780 tons of rails to Gothenburg, 300 tons to Lisbon, 1467 to Montevideo, 2330 to New York, and 2318 tons to New Orleans. The Landore Siemen's Steel Works are making tolerably heavy exports of rails to New York. The coal traffic to London during January, from the South Wales pits, was 31,385 tons, an increase of 4500 tons over December last. Prices there, as elsewhere, are on the rise, going up as they do in flying leaps of 2s. and 3s.

Elsewhere there are a good many labor disputes. In South Staffordshire the 10,000 colliers employed in the South and West of Dudley gave notice, a short time back, for a shilling per day advance. The masters offered sixpence advance, which has been accepted on the condition that if an advance in the price of coal be made the men will demand a full rise—much more, they say, than 1s. per day. On Saturday the horse nail and common nail makers of East Worcestershire and South Staffordshire gave notice of an advance of 3d. per 1000 on horse nails and 10 per cent. on list prices for common nails. The Tyne tug owners have struck, owing to the ship owners declining to grant their higher terms, and consequently shipping transactions on that river are somewhat hampered. At Edinboro' the printers' strike has terminated in favor of the employers, and the men have resumed work on the 54 hours weekly basis, after a 13 weeks' fight. Some departments of the civil service are agitating for advanced salaries; the Sheffield scissors grinders ask for 30 per cent. rise, and will probably get it, the number of men in the trade being carefully limited by the trade union, who have for some time past declined to admit any apprentices, except under most stringent conditions. Before quitting the subject of strikes, I may say that on Friday afternoon last a conference of South Staffordshire and North of England iron-masters was held in the Cannon Street Hotel, London, in order to discuss the position of employers with respect to the strike movement. Several suggestions were made, but it was deemed advisable to take time for consideration before taking any practical action in the matter; the conference therefore stands adjourned *sine die*.

The general tone of the iron trade is very firm, with a tendency to stiffer prices. Prices of Scotch ought now to have reached their maximum, seeing that the production is being increased weekly by the blowing in of additional blast furnaces. Shipments again show a falling off. The malleable iron trade is still very slack, many of the works being only partially employed. Plenty of inquiries are to hand from Canada, but rather than make iron at a loss in Scotland, some firms are purchasing at £11. 5s. to £13 in Staffordshire.

The Cleveland returns show that the make of pig fell off 2000 tons in January, the total being 164,125 tons, and stocks decreased from about 40,000 to 34,000. The coastwise shipments also decreased, but foreign shipments increased over 7000 tons. In the face of these facts it is not surprising to learn that the Cleveland (Middleboro') market is very firm; No. 3 being quoted at £3 and No. 4 Forge at £5. 17s. 6d. Messrs. Jacques, South Stockton, have just started another Danks' puddling machine. Messrs. Greaver & Ellis' improvements in fettling (with ironstone instead of sand and cinders) are being tried at Skerne Iron Works, Darlington, and are said to reduce the cost of that process 6s. per ton. There are numerous inquiries for rails on account of home and foreign lines, and general merchant iron is in good request for present wants. Last month 11,000 tons of pig were exported from this district to Belgium; 9000 to Holland; 6000 to France; and 27,000 tons went in smaller lots elsewhere. Rails were also shipped—300 tons to Cardenas; 600 tons to New York; 400 tons to Galveston; 750 tons pipes to Mallendo and plates to Antwerp. Current prices are: Puddled bars, £9. 5s.; rails, £12. 10s. to £13; common bars, light rails, and nail rods, £13 to £13. 10s.; best bars, cable iron, rivet iron, angle, and bulb iron, £13. 10s. to £14; ship plates, £14. 10s. to £15; best best bars, £15 to £15. 10s.; hoops, £15. 10s. to £16; boiler plates, £16. 10s. to £17; sheets (singles), £17 to £17. 10s; cast girders, £10 to £11; pipes, 24 in. to 1½ in. diameter, £9. 5s. to £11; chairs, £6 to £6. 10s.; wrought girders, £20 to £21; bolts and nuts, £30 to £36 per ton; but the prices asked are generally 20s. per ton more for the principal articles of manufacture. At Barrow-in-Furness, in West Cumberland, at Carnforth, Cleator Moor, Maryport, Whitehaven, etc., great activity is observable, the whole of the iron and steel works being fully employed, a good deal of railway iron going thence to America. At Whitehaven and Barrow nearly 10,000 tons of iron strips are being put together, and the engineering establishments are in full work. Borings for coal are being made at Harcourt and Rampside.

In West Yorkshire prices have become very firm, pigs having a tendency to go up several shillings. Best brands of iron, such as Low Moor, Bowling, Taylor's, Farnley Co's., Kirkstall, Forge and Monk Bridge have gone up about £2 per ton—prices being more a question of delivery than anything else. The engineering and machinery making establishments in this district, as well as in the adjoining South Yorkshire locality, are well employed. The Sheffield steel houses are, as a rule, busy, the larger firms being still some months in arrear. New orders are, however, not by any means so good as those of June or July, last. America is one of the best customers, as usual. Some attention having been drawn to the peculiar qualities of the Mushet's special tool steel (or tungsten steel) made by Messrs. S. Osborne & Co., Sheffield, I subjoin a cutting on the subject from *Iron* (an English paper newly started). "M. Gruner, Inspector General of Mines in France, has made special examination, and states Mushet's special steel to be a true alloy of iron and tungsten, containing nearly 8 per cent. of the latter element. Such an alloy has been well known since 1855; and ten years ago MM. Gruner and Lan published the results of all knowledge then possessed, from which we learn that, up to the proportion of 3 per cent., tungsten increases both the hardness and tenacity of steel; but beyond that proportion the tenacity decreases, while the hardness continues to increase. With 6 per cent. a bar of steel became as brittle as glass. The question thus arises, by what process this defect is remedied in the preparation of Mushet's special steel. This M. Gruner believes to be by the use of a very pure steel, made from a very superior quality of iron; tungsten being reduced with cemented steel made from the finest Swedish brands of iron. This, at least, is the process now and for a long time followed at the Maisons-Alfort Ironworks for the manufacture of tungsten steel, by M. Mazeline Fils and his predecessor, M. Micolon, at St. Etienne."

There is still a good trade doing in steel rails, tires and other railway requirements, but some of the cutlery branches are slack. As chronicled above, a wages' dispute is probable in the scissors department. The American houses are particularly slack just now. Edge tools are in request, and the armor plate mills continue fairly busy. Files and saws are yet inquired for, and the sheep shear makers are doing a good stroke with Australia, New Zealand and South America.

In the Wolverhampton and Birmingham district a fresh advance of finished iron has taken place, this time to the extent of 20s. per ton. Earl Dudley and Messrs. Barrows took the lead and the remainder of the trade have followed. Earl Dudley's bars are now £14. 12s. 6d., and Messrs. Barrows, £14, fully. Singles sheets are realizing £19, that being the quotation of J. Bradley & Co., Cookley Iron Co., Messrs. Baldwin, The Hope Co., Thompson & Hatton, and Messrs. Sparrow. The Bilstone Iron Co. still quote £18, but all makers fight shy of very large orders, owing to the present difficulty of obtaining fuel. Several fuel economising contrivances are being tried in the district, one or two of which have proved fairly successful. The Birmingham gun trade is improving for cheap work, and a good demand has set in from the United States. Messrs. Grubb & Co.'s representative (from Philadelphia) has just been in Birmingham, and has placed some good orders for guns. Mr. Richards, of J. P. Moore & Sons, New York, is also at Birmingham, and Mr. Spencer (Biggs, Spencer & Co.) is expected. These firms buy pretty largely of Birmingham ammunition and guns. Iron founders, carriage ironwork makers, gas tube and strip manufacturers, makers of steel toys and brass founders are all busy. Electroplaters, both at Birmingham and Sheffield, are fully employed. Nuts, bolts, chains, screws, wire and sheets are reported to be in great demand, the United States and Canada forwarding some good indents. Quotations are, as a rule, nominal, and are likely to go up still further.

The metal market is flat, but, except for copper, prices have not sensibly given way. Copper was rather strong at the beginning of the week, on the announcement of the Chili charters, Wallaroo realising £94; Chili, g.o.b., £87. 10s. to £88; and Lota, £87. 15s.; but there has since been a reaction, and on Thursday small quantities realized only the following prices: Wallaroo, £92. 10s., cash; Lota, £85. 5s. to £85. 15s.; and other brands £86 to £88.

Ores, at Swansea Ticketing, realised an average of 16s. 8¾d. per unit, and Cape ores, 17s. 6d. Chili charters were announced for the first half of January, being only 1800 tons in all, consisting of 1000 tons bars, and 800 tons ores and regulus, for England. On Wednesday sales to the extent of 450 tons were effected in Chili and Australian. Prices were very firm, notwithstanding good advices received from the west coast. This may be in a measure accounted for from temporary causes—principally the difficulty arising from meeting prompts. Urmeneta sold at £88 cash, down to £87. Lota was done at £86. 10s.; in Australian no transactions were reported.

On Thursday the market continued to droop, and prices again ruled in buyers' favor. About 350 tons of Chili bars changed hands, "J. Edwards," at £88 cash, g.o.b., £86 to £86. 10s.; and Lota, £85 to £85. 15s.; 50 tons of Wallaroo realized £93. 10s., cash, and a smaller parcel £1 more, with three months prompt.

SPELTER.—There has not been much doing in this metal. The market is, however, very firm, and prices are unaltered, Silesian being quoted at £25, and English hard at £14. 10s.

TIN.—The tin market has shown a disposition to increased firmness during the week, and a slight advance in price has been established; early in the week £143. 5s., cash was accepted for Straits. On Wednesday the market improved to £144, cash; 50 tons Australian ore, sold by private tender, realized £61 to £91. 17s. 6d.; English ingots, £146; and bars, £147. The market was firm on Thursday, and Banca was sold at £147. The last sales reported of Straits show an advance of £145, cash, and Billiton £142.

TIN PLATES are in fair demand; prices unaltered.

GUNPOWDER.—The value of gunpowder exported last month was £36,149, against £23,550 in the same period last year.

Trade Report.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, March 12, 1873.

The events of the past week in Wall street have been of interest chiefly to the operators in the various financial markets, rather than to the mercantile community. The general condition of the street has been feverish, and an unsettled feeling has pervaded all departments of business. This condition of affairs has been brought about chiefly through the operations of a strong "clique" of speculators in money, gold and stocks. Part of the operations of this clique consisted in locking up gold, which had the effect of making money very tight, currency loans being negotiated at rates as high as ¼ of 1 per cent. per day. On Saturday the clique began to sell gold freely, and money became comparatively easy in consequence, the rate on call declining to 7 per cent. gold. There has been no market for commercial paper, and only prime names have been able to command a discount of 9 @ 12 per cent.

In gold there has been an active speculation, with fluctuations in the premium as shown in the following table:

	Highest.	Lowest.
Thursday	115⅛	115
Friday	115⅛	115⅜
Saturday	115⅛	115⅝
Monday	115⅝	115
Tuesday	115⅛	115
Wednesday	115¼	115

The stock market has been strong throughout the week, the speculators for a rise having generally made a profit, even though paying exorbitantly high rates for money. Pacific Mail and Panama advanced most rapidly. After these came the Vanderbilt stocks, Western Union, C. C. and I. C., Rock Island and Lake Shore.

The bond market has been dull, fluctuating in sympathy with gold. The current quotations of both stocks and bonds are given below.

The following are the movements of foreign trade for the week:

IMPORTS.

	1871.	1872.	1873.
Tot. for week	$8,309,446	$7,170,217	$9,404,893
Prev. reported	58,097,940	69,443,308	73,070,728
Since Jan 1	$66,307,386	$76,613,525	$82,475,621

Included in the imports of general merchandise for the week are:

Anvils	948	$2,812
Brass goods	41	5,446
Bismuth	2	1,423
Bronzes	14	1,700
Chains and anchors	175	8,511
Copper	...	52,873
Cutlery	133	45,613
Guns	29	6,976
Hardware	59	6,059
Iron, hoop, tons	88	5,485
Iron, pig, tons	1,304	45,531
Iron, sheet, tons	246	21,252
R. R. bars	6,613	83,078
Iron cotton ties	337	1,152
Iron, tubes	856	1,496
Iron, other, tons	1,379	62,649
Lead, pigs	4,412	94,066
Lead, tons	10	896
Metal goods	481	30,510
Nails	42	913
Needles	18	10,021
Old metal	...	22,550
Percussion caps	3	650
Saddlery	8	1,617
Steel	6,679	71,714
Spelter	220,642	8,538
Silverware	2	101
Tin, boxes	22,494	276,659
Tin, 1200 slabs	45,850	14,330
Wire	530	10,368
Zinc	16,670	1,066

EXPORTS OF MERCHANDISE.

	1871.	1872.	1873.
For the week	$6,264,325	$4,383,985	$5,398,314
Prev. reported	39,477,283	37,587,344	44,299,975
Since Jan. 1	$43,741,608	$41,971,329	$49,698,289

EXPORTS OF SPECIE.

Total for the week	$904,288
Previously reported	10,331,654
Total since January 1, 1873	$11,235,942

The banks, according to the weekly statement rendered, fall short of the 25 per cent. reserve only $294,875, the deficiency last week having been $312,350. The following is a comparison of the averages of the past two weeks:

	March 1.	March 8.	Differences.
Loans	$284,344,900	$280,351,300	Dec. $993,600
Specie	16,370,500	17,149,600	Inc. 779,100
Circ'lation.	27,601,300	27,801,200	Inc. 199,900
Deposits	202,066,100	199,508,700	Dec. 2,557,400
Leg. Ten	40,724,700	39,473,000	Dec. 1,251,000

Government bonds at the close were steady. We quote:

	Bid.	Asked.
U. S. Currency 6s	113½	114
U. S. 6s, 1881, reg	116½	116¼
U. S. 6s, 1881, c	118⅝	118⅝
U. S. 6s, 5-20 reg. May and Nov	115⅝	116
U. S. 6s, 1862, c	115⅝	116
U. S. 5-20 1864, c	115⅝	116
U. S. 5-20 1865, c	116⅛	116¼
U. S. 5-20 1867, r. Jan. and July	114⅝	114⅞
U. S. 5-20 1865, c. Jan. and July	114⅛	114⅜
U. S. 5-20 c. 1867 " "	116⅛	116⅜
U. S. 5-20 c. 1868	116	116⅛
U. S. 10-40 reg.	110¾	110⅝
U. S. 10-40 c	110¾	111
U. S. " c	113¾	113¼

IRON.

American Pig.—There has been a fair inquiry for Nos. 1 and 2 Iron the past week, and several parcels sold, though particulars are generally withheld. Forge Iron is more plenty, and the market for this brand scarcely so firm as a few weeks ago. First quality Lehigh No. 2 Foundry Iron is held at $48, but several good brands are offered decidedly lower, some at $45, while one is reported at $44. No. 1 Iron is held very strong at $50. Sales that have been made public during the week embrace 850 tons No. 1, on private terms; 50 tons No. 2 Carbon at $47·50, and 500 tons No. 2, the terms of which did not transpire. We quote: No. 1, $50; No. 2, $44 @ $48, and Gray Forge, $40 @ $42.

Scotch Pig.—The market for Scotch Iron still presents an exceedingly quiet appearance, and transactions limited to small parcels from yard for immediate use. But little is arriving, and the stock here is becoming gradually depleted, and importers continue very strong in their views. Sales during the past week include 50 tons Eglinton on private terms, and small lots of other brands within the range of our quotations. We quote Coltness $62·50 @ $65; Gartsherrie, $60; Glengarnock, $57 @ $58; and Eglinton, $55 @ $56.

Following are the prices of Scotch Pig Iron in Glasgow, as reported by Messrs. J. E. SWAN & BRO., under date of February 21, 1873:

GLASGOW BRANDS.

	No. 1	No. 3	No. 4
Gartsherrie	165/	140/	....
Coltness	165/	142/	....
Summerlee	160/	140/	143/
Langloan	165/	142 6	....
Govan	139/	138/	137/6
Calder	*160/	140/	....
Shotts, Bessemer	170/	165/	....
do Ordinary	160/	140/	....
Carnbroe	150/	140/	140/
Wishaw	139/	138/	130/
Monkland	142 6	140/	....
Chapelhall	145/	140/	....
Clyde	140/	138 6	....
Quarter—Clyde	140/	138 6	135/

Glasgow Warrants 3-5, No. 1; 2-5, No. 3, g. m. b. 128/.
*f. o. b Glasgow, 1/ per ton, extra.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock	150/	140/	...
Ardeer			
Eglinton			
Lugar	Branded Eglinton 140/	138/	139/
Muirkirk			
Portland			
Dalmellington	140/	137/6	137/6

CURRENT RATES OF FREIGHT ON PIG IRON.

To	From Glasgow.	From Ardrossan.
New York	12/	15/
Boston	20/	20/
New Orleans	20/	20/
Baltimore	17/	17 6
Philadelphia	20/	20/
Providence	20/	15/

Bar.—Refined Bar from store has been advanced $2·50, and other Manufactured Iron as follows: $5 on Swedish Bar, $2·50 on Large Rounds, Rods, Ovals, Half Ovals, Half Rounds and Band; $5 @ $7 on Hoops, and $10 on Scroll, and the market rules very strong at the higher figures.

Old Rails.—There is a moderate demand for Old Rails, and prices still rule very strong at $51 @ $52, gold, for T and Double Head. Sales include 100 tons Double Head from ship, at $58; 100 tons do. at $58, and 118 tons T at $55, all currency.

Rails.—New English are without reported movement, and the value entirely nominal at $70, gold. New American are quiet for immediate delivery, and offered at $80, from the mills, but for future delivery there has been a fair movement, and sales made of about 10,000 tons, April, May and June delivery, the latter at $85, currency.

Scrap.—The stock of Scrap in yard is small, and held very firmly at $57·50 @ $60. Sales include 200 tons at $60, to go East, and 100 tons from the wharf on private terms.

METALS.

Copper.—The feature of the week has been one of the largest movements in Lake Copper ever known. Immediately succeeding our last review manufacturers commenced to contract with the Lake companies for summer delivery, and nearly 10,000,000 lbs. were taken June to September, mostly at 30c.; since which the market has ruled quiet. For immediate delivery sales have been limited to small lots, but as the stock is not heavy, and well under contract in few strong hands, prices are sustained, and, if anything, a trifle firmer. The cash sales foot up about 200,000 lbs., at 34½c. @ 35c. The demand for English Copper is also light, the transactions since our last not reaching over 100 tons Best Selected, at 29½c. @ 30c., 30 days. Manufactured Copper and Yellow Metal continue steady. A meeting of manufacturers was held on the 5th instant at Baltimore, and although the deliberations were private, it is generally understood that prices were not changed. We therefore repeat former figures: New Sheathing, 43c.; Bolts and Braziers, 45c.; Bronze and Yellow Metal Sheathing, 27c.; and Yellow Metal Bolts, 32c., net cash.

Tin.—Early in the week there was considerable trade in Pig Tin, the fact that prices here were relatively cheaper than those abroad attracting the attention of buyers, and sales were effected of 5000 slabs Straits at 31c. @ 32½c., and 300 slabs at 31¾c.; later the market has ruled quiet, but prices have further advanced, and held very strong. We quote: Straits at 32½c. @ 32¾c., English at 32c. @ 32½c., and Banca, 37¾c., all gold. The latest cable advices quote Straits at 145s. and English 146s., in England, and $36 per picul at Singapore. Plates have been in fair request, and firm, with an upward tendency. We quote: Charcoal Tin,

$13 @ 12·25; Coke Tin, $10·50 @ $10 75; Charcoal Terne, $10·75 @ $11·25, and Coke Terne, $8·75 @ $9·75. From a late trade circular we learn that the importations during February embraced 4235 slabs, or 170 tons, Straits, and 35 tons English, with 15,518 slabs, or 605 tons, Straits in transit, all due March, April, and May. Stock in importers' and speculators' hands, here and in Boston, 17,000 slabs, or 650 tons, Straits and 20 tons English.

Lead.—The transactions in foreign Pig continue light, but former prices are fully sustained. The arrivals the past week have been liberal, but mostly sold to arrive. Included in transactions have been 225 tons Spanish, on private terms. We quote ordinary foreign at 6⅛c.; Refined do., 7⅛c. @ 7¼c., and Domestic, 6¼c., all gold. Manufactured Lead continues steady at 9¼c. for Bar, 10¼c. for Sheet and Pipe, and 16¼c. for Tin Lined Pipe, all less the usual discount to the trade.

Spelter and Zinc.—The stock of foreign Spelter is light, and held very strong at a further advance. Early in the week 10 tons Stolberg sold at 7⅝c., and 100 tons do. at 7⅝c., gold; and later small lots Silesian have changed hands at 7¾c., gold. Sheet Zinc continues quiet but steady at 10¼c. @ 11c.

Antimony.—We hear of only small lots Regulus having been sold at 14¼c., gold.

The following is the review of the metal market specially prepared for *The Iron Age* by Messrs. THOS. J. POPE & BRO.:

Pleasant weather and the prevailing thaw seem to be relieving the recent dullness in trade; which, though quiet, shows more signs of activity than for several weeks back. Trade, however, may continue in check for several weeks, till money becomes more easy. Gold rules high. The great depletion of treasury gold, and the small amount held by the banks, indicate probabilities of higher, rather than lower, rates. Each year for the past four years the specie reserve of the country has diminished so greatly as to excite the attention of careful observers.

INGOT COPPER is nominally unchanged, but the heavy decline in Lake for next summer deliveries—ten million pounds—at 30c. would indicate after June 1st lower prices; this sudden decline in Lake Copper for next season is owing entirely to the competition of English Copper, whose wholesome effect upon our market make it a great favorite with consumers who did not fancy being cornered at 40c. to 50c. If competition be not the life of trade, it certainly is the death of monopoly. Doubtless, the English is become now an established article in this market, which will always need a wholesome corrective for exclusive privileges.

PIG IRON—Very quiet and firm at unchanged prices, both for Scotch and American. The opening of navigation, and the commencement of spring activity, are confidently waited to start anew the iron trade of the country.

SPELTER—Generally firm at 8c., gold.

LEAD—Active; in foreign the market is swept of all stock offering.

TIN—Higher, 32½c. to 33c., gold; active.

ANTIMONY—Quiet, at 14¼c. to 15c., gold.

GENERAL HARDWARE.

During the week the attention of the trade has been to a great extent concentrated on Locks, the rupture reported in our last being the theme of general conversation, even among the trade not interested in that class of goods. As we went to press last week on the day on which the combination broke up, we found only part of the trade ready to speak with definiteness about their prices. Since then discount 40 per cent. has become the usual price for the makers previously in combination. The Norwalk Lock Co. quote discount 35 and 7½ per cent., which is about the same thing. Mallory, Wheeler & Co. quote discount 40 and 10 and 2 per cent. from their list, which does not net by any means as low as discount 40 per cent. from the usual list, but we are informed that their sales have been made on terms netting about the same as other makers. We do not see any probability of the trouble being soon "settled up," as the competition between the makers is sharp, and there is a good deal of bad blood. Meanwhile the sales of Locks are large, and heavy stocks are being laid in, which will make it hard for the manufacturers to advance prices very soon. We have received the following letters:

CHICAGO, March 10, 1873.

To the Editor of The Iron Age: Your disposition to diffuse information interesting and useful to Hardware dealers, induces me to "post" you in regard to transactions of Lock Makers with their patrons in this market.

We and other dealers were induced last year, previous to the change in prices, and by intimations given us of probably early advance in prices, to enter our orders for full stocks of Door Locks and Trimmings. The stocks were received in due season, and paid for, but not sold by the jobbers in consequence of general curtailment of business, caused by horse disease, low prices of produce, severity of the winter, &c.

These Lock manufacturers having worked off their stocks on us, and got our money, continued their production with increased facilities until they again loaded themselves with new stocks. Again they solicited our orders; this time at the advanced price, and before we were in a condition to buy. Therefore, instead of waiting until the resumption of business and we had unloaded, they seek our trade, which not being able to get while we continued to offer goods at reasonable prices, predicated on cost, they adopt a new policy by trying to discount the natural demand. The result thus far is the reduction of prices and limited sales.

As your paper does not admit harsh language, we must defer characterizing the conduct of certain millionaire manufacturers until we meet their representatives face to face. In the meantime we shall retain our trade, notwithstanding the hundreds of telegrams sent to our customers and the disposition referred to.

When we again stock up we shall give our preference to makers who prefer the jobbing trade to small dealers and consumers, and who have in the past given evidence of disposition to protect us as LOCK JOBBERS.

To the Editor of The Iron Age.—The information given by you, under date of the 5th inst., of reduction in the prices of Door Locks and Knobs, is confirmed by actual sales, and the fact tends to destroy confidence in the stability of prices on other articles of American Hardware; therefore, it seems proper for me to give information of the causes which led directly to the recent reduction in the goods referred to.

The letters patent under which Reversible Locks are manufactured are owned and used by the Pittsburgh manufacturers, the Norwalk Lock Co., Branford Lock Works, and the Russell & Erwin Mfg. Co. One of the patents "which did not hold water" was owned by Messrs. Mallory, Wheeler & Co. The latter firm having confidence in the validity of their patent, made and sold Reversible Locks to a large amount, but the Russell & Erwin Mfg. Co. claiming the ownership of a prior invention, sued M., W. & Co. for infringement of their patent, and sustained their claim in the courts. The manifest disposition of the R. & E. Mfg. Co. to collect all the damages they can recover through referees appointed by the court, has caused a bitterness of feeling between these wealthy companies, and has led, under competition for business, to the break in prices.

Now that these giants are armed for conflict, dealers may stand aside and pick up the pieces at small cost, and if other makers join in the contest (as I presume they will) there will be a good many valuable bits to be gotten for small investment of money.

There has been but little, if any, money made by the Associated Lock Makers for the last three years, the bulk of the deliveries since the advance in prices last season having been on sales made previous to the advance. Locks made from stock at present high cost carry only a reasonable profit at 25 per cent., and the prices should be restored; but are not likely to be unless under a new combination.

Combinations at best are objectionable, but agreements made between Lock makers have been so loosely kept that the managers have become notoriously demoralized, and a moral punishment should, and will, surely follow.

Men who enter into verbal, and even written, agreements to-day, not to sell goods under certain fixed prices, and to-morrow sell bills of Locks at prices agreed, *and give away* to the purchaser other goods equivalent to 5 or 7½ per cent. in the amount of Locks sold, or, which is the same thing, sell articles at 2½ per cent. advance on cost, which at most carry only 5 per cent. advance when sold regular, deserve no sympathy when they get to "pulling hair" among themselves. These Lock trade tricks have been done continually by those who had other goods to sell with their Locks, and those who had not, retained their large customers by more direct, if not more honorable, means. If you want further information call for

OLD HONESTY.

The following letter in answer to the question of "Hardware," in our last, will be read with interest by all classes of the trade:

To the Editor of The Iron Age:

DEAR SIR—I have read with much interest the remarks of "Hardware," in your last issue, upon the following text, as stated by himself: "An average expense of 8¾ to 9 per cent. forbids the sale of articles like Axes, Shovels, Nails, Horse Shoes, Screws, &c., on which there is only a margin of 5 per cent." He asks: "Would you advise the jobbers to continue the business of distribution of goods of such manufacturers as refuse to protect them to the extent of 10 per cent. against their own sales?"

Speaking as a manufacturer, I would say that the sooner the jobbers will discontinue this "business of distribution," the better it will be for the manufacturers and for the consumers of the standard articles mentioned above. The jobbers are now occupying a position which is of no earthly benefit to any one excepting themselves, and if they are not benefited by it, it is to be hoped that they will retire from it with all possible dispatch. Can any one tell in what way the interests of the public are served by having a set of middlemen standing between the manufacturers and the small traders, by whom Horse Shoes, Screws, Nails, Shovels and Axes are distributed to the consumers? And can any one tell why an extra charge of 10 per cent. should be put upon these articles, at the expense, ultimately, of the consumer, in order that a company of middlemen, located in the very cities where the manufacturers are at the expense of maintaining their agencies, may make a profit out of a business which benefits no one? It is a convenience for the small trader to find collected in a jobber's store the numberless small articles of limited sale that go to make up a hardware stock; but it is no hardship for him to go direct to the manufacturers, or to their agencies in all the great cities, to purchase those standard articles for which there is a constant daily demand.

So far from being an advantage to the manufacturers of standard articles, the existence of a class of hardware jobbers is a detriment to them. It is preposterous for the jobber to call for a discrimination of 10 per cent. in his favor, as against a smaller purchaser, for the reason that, excepting where the manufacturer of an article holds a monopoly and can enforce his regulations, the jobber himself is the very first to break the market by dividing his discount with his smaller customer. Is it not a notorious fact that the jobbers do not avail themselves of even the moderate discount that is given upon the classes of goods quoted by "Hardware?" To call for a larger discount, when even the present one is not taken advantage of, would be an absurdity, were it not for the covert motive which, while it does no credit to the honesty of the caller, does, at least, redeem him of the suspicion of stupidity. That motive will be clearly seen by the reflection that if the manufacturers could be induced to give a ten per cent. discount to the jobbers, and charge full rates to the country trade, the jobbers could then undersell the manufacturers, and so, gradually, collect all the small trade into their own hands, and eventually dictate their own terms to the manufacturers. And that this is no fanciful evil will be evident when we ponder upon the fact that even under the present state of affairs the hardware jobbers can almost control the price of the standard articles above referred to, as is evidenced by the fact that for months after a nominal advance has been made in the rates of any of them, and notably of Nails, no manufacturer expects to do anything more than to fill contracts at old rates. So entirely are the manufacturers in the hands of the hardwaremen, that it requires from three to four months for the former to make *and realize* an advance in the price of their goods; and, during all that time, they are delivering goods on old contracts at cost or less (for no advance is attempted until necessity compels it), while the hardwaremen are reaping enormous profits out of their contracts. And when these contracts are drawn up, two or three of the heavy jobbers coming into the market again with their orders, soon offer a temptation to some one of the weaker manufacturers; he sells, and the market breaks, and so what was nominally an advance for the manufacturer is ultimately a profitable operation for the jobber, and the market is kept in a continual and unnecessary state of fluctuation, for the sole use and benefit of the hardware jobber, *whose interest it is* to maintain this state of affairs, and who deliberately labors to raise and depress the market accordingly as his purposes require. And so I say that the existence of a class of hardware jobbers is a detriment to the manufacturers of standard articles; and if they, the jobbers, have any idea of "discontinuing the distribution" of those articles, it is to be hoped that they will decide to do so.

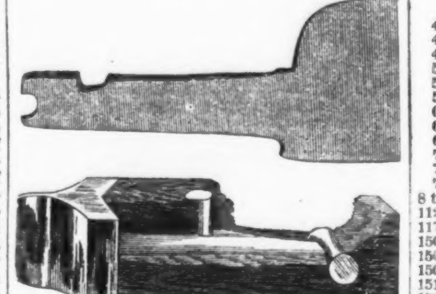
But, after all, the remedy for this state of affairs lies in the hands of the manufacturers. If they would cease to make any contracts for deliveries of goods not in store, the element of speculation would be taken out of the purchases of hardwaremen. The latter would have to depend entirely upon their discounts for their profits, and would consequently maintain the price, and the unhealthy fluctuations of the market would cease. If middlemen are necessary at all, they should make their profits out of their regular commission, and not out of speculation, and the manufacturers can compel this whenever they see fit. MANUFACTURER.

The Union Mfg. Co. have issued a new catalogue of their manufactures, illustrated with handsome cuts. They are constantly adding to their line of goods, and this book contains many new articles. Their assortment of Butts and Pumps is very complete, and every Hardware dealer should have a copy of their catalogue, which they will be glad to furnish. They are also preparing a discount sheet.

Stephens & Co., Rule makers, have issued a circular, stating that their price is discount 60 and 10 per cent. The following is the conclusion of the circular:

"We do not look for an advance for a long time. We shall expect to run upon the closest possible margin, and, in our opinion, those merchants who overstock in anticipation of immediate advances, will not realize them."

The Woods Cutlery Co., of Antrim, N. H., are the makers of a class of Table Cutlery that merits the attention of the trade. From what we have seen of it, we judge it to be both excellent and cheap. Of its attractive appearance there can be no doubt. This Cutlery is made under several patents, and has been in use for some years in the section where it is made, almost to the exclusion of other Cutlery, as we are informed. The manufacture was first begun in a very small way, and the goods were very roughly turned out. The business has, however, lately been taken hold of by a joint stock company with sufficient capital, a new factory built, and the business put on a firm footing. The peculiar feature of these goods is the manner in which the tang is inserted in the handle, which has holes to receive it and form the rivets to hold them together. They are both placed in a mold and melted metal poured in, which, at one operation, forms the bolster and rivets, and fills the space around the tang, making a handle which can never become loose or be separated from the blade without breaking it in pieces; it is also practically hot water proof, and is so warranted. This will be readily seen from the accompanying cuts, one of which



shows the shape of the tang, and the other the appearance of a handle with the wood cut away enough to show the metal inside. In another style the metal surrounds the wood of the handle with the exception of part of the side, giving it the appearance of being inlaid in the metal handle. A very handsome Knife is made at very slight expense, by fastening a thin scale of ivory on either side of a wooden core, the ivory only being seen at the sides. Beside being cheaper, it is claimed that these goods are much less liable to check than if they were solid ivory. We had intended to print the list of prices of these Knives, but have not room this week. They will be furnished on application to the New York warehouse, 55 Chambers street, Geo. B. Walbridge.

Trade in foreign Hardware is remarkably dull for this season, but prices continue firm, with an upward tendency. There is no change to report in the price of Coil Chain and Traces, the stocks of which are light and market firm at our quotations. Birmingham letters, dated Feb. 22, quote Coil Chain as follows: 3-16, 37/; ¼, 29/; 5-16, 26/; ⅜, 24/; 7-16, 23/; ½, 22/; 9-16, 21/6; ⅝, 21/. Peter Wright's Anvils are in fair supply, and the recent advance of two shillings per cwt., mentioned in our last issue, has strengthened holders in their views, and prices are firm at 12½ cents, gold, for ordinary sizes, and 13 cents for Anvils weighing 250 lbs. and over. Stubs' Files are very scarce, and the market bare of desirable sizes; holders have no difficulty in obtaining $8, gold, both from stock and to arrive. Brades Trowels are quoted at from list net to discount 10 per cent. Wilkinson's Sheep Shears are in good request with fair stocks; holders ask 15 per cent. discount from list, but in the case of large orders a better figure could be obtained. Beam & Murray quote "Cyclops" Files at $4·85, gold, with a steadily increasing demand, and a light but well assorted stock. On the 11th instant the manufacturers of Cordage reduced the price of Sisal Rope half a cent per lb. We quote sizes above ⅜ in., 15½ cents; ¼ and 5-16 in., 16½ cents; ⅜ in. and Hay Rope, 16 cents. There is an improved demand for Nails this week, which are firm at $5·25 for 10d to 60d, less the usual discount for quantity. Lots of 1000 kegs and upward could be placed at $5, net.

As promised in our last, we print below the list prices of the goods made by the Hart, Bliven & Mead Mfg. Co. It is the longest list of prices we have ever printed; but the fact that the book containing them will not be in the hands of the general trade for a considerable time gives this publication great value to their numerous customers throughout the country. Among the new goods contained in this list we notice particularly Connell's Patent Crank Door Bells, which they manufacture in a variety of tasty styles. These Bells have but one hammer, and strike on turning the crank either way; they are very simple, have but one spring, and can be fitted to doors of any thickness. They seem a valuable addition to the line of Gong Bells now before the trade. We would also call attention to the new Twine Boxes on page 151. They are made in two styles: one for hanging up and one for screwing to the counter. They are attractive in appearance, simple, strong, and large enough to hold large balls of twine. They print the following terms, and say, "Orders are solicited on these terms only:"

"All bills become due on date of shipment."

"If bills are paid within thirty days no interest will be charged. Running accounts to be settled monthly. All bills not paid within thirty days will be drawn for at sixty days from date of invoices—without notice—with exchange on New York; also, with one month's interest added."

From the circular which begins the book we make the following extracts:

"On the receipt of letter orders, our rule will be to fill the same immediately, as far as possible, from our stock, and the balance of the articles will be sent (unless countermanded) as soon as they come to hand, at prices ruling at date of shipment.

"In making up our new Catalogue and Price List we have endeavored to learn the net cost of production and the lowest net selling prices of other manufacturers of similar goods. Based on the same, we have established our long prices, from which we can make uniform discounts. The list prices which have been fixed on goods of our own manufacture will not be changed; but we will vary our discounts to meet the changing costs of production and the general market prices.

"We will cheerfully correct all mistakes, and be thankful for information of the doings of our competitors; but, as we purpose to keep our prices down and make all bills of goods average as low as other makers of like articles, we shall decline to alter our invoices, and will deny all claims for abatement based on newspaper or special quotations, and not general in this market.

"When parties order goods other than those mentioned in our catalogue or discount sheets, we shall act as their agents, and charge a purchasing commission of five per cent., but will assume no responsibility as to prices, quality, etc., for the reason that we do not invite such orders."

For the sake of completeness we repeat here the discounts from this list, as given by us last week:

Page.		Dis. Per cent.
2	Nickel Plated Steel Squares	50
3	Nickel " " by the case	50&10
	Add for Nickel Plating,	
	All 1 foot Squares .... $2·50 ₱ doz. extra.	net
	All 1½ in. wide Squares .... 3·00 " "	net
	2 in., Nos. 3, 4, 5, 6 .... 3·50 " "	net
	2 in., Nos. 1, 2, 2½, 15, 100 .... 4·00 " "	net
2	Steel Rules .... 3·00 " "	net
	Parties who become entitled to the full discount on Steel Squares will be allowed 5 per cent. discount on our prices for Nickel Plating.	
2	Steel and Iron Rules	50
3	Carpenters' Steel Squares	50
3	" Iron "	50
	" Steel and Iron Squares, by the case	50&10
4	Socket Firmer Chisels, No. 1, or extra	60&5
4	" " No. 2	60&5&10
4	" Corner Chisels, No. 1, or extra	60&10
5	" Framing Chisels, No. 1, or extra	60&10
5	" " No. 2	
5	Carpenters' Slicks, No. 1, or extra	60&10
6	" Drawing Knives, No. 1, or extra	60
6	" " No. 2	60&10
6	Coach Makers' " No. 1, or extra	60
7	Wagon Makers' " No. 1, or extra	60
7	Farmers' "	50&10
7	Shingle "	60
8 to 111	All Articles named on these pages	50
112 to 116	Casters, all kind	20
117 to 149	All Articles named on these pages	50
150	Family Grindstones	50
150	Nut Cracks	50
150	Butchers' Cleavers	45
151	Match Safes	50
151	Twine Boxes	40
152	Boot Jacks	50
153 to 158	Carriage Bands, Silver Plated	add 10
153 to 158	" Solid Oroide	add 15
	Extra for Gold Plated on Solid Oroide Bands:	
	Heavy Rim, 1½ in. deep .... $0·75	net
	Cincinnati Rim, 1¾ " .... 1·00	net
	" " 2 " .... 1·25	net
	" " 2¼ " .... 1·50	net
	" " 2½ " .... 1·75	net
	Central Park, 1½ " .... 1·00	net
	" " 1¾ " .... 1·25	net
	Bell, 1½ " .... 1·00	net
	Bell Central P'rk 1¾ " .... 1·25	net
159	Carriage Bands, Iron Rim	15
159	" " " Bell	10
160	Shaft Sockets, Nos. 5 and 10	15
160	" " No. 15	10
161	Shaft and Hame Sockets	15
162 to 166	Whiffletree, Neck Yoke and Pole Sockets	10
167 to 171	All articles named on these pages	50

In the following columns we give the page of the catalogue on which the various prices are printed, so that the discounts, which refer to pages, can be easily understood. On January 23d we printed the new list of Squares. The list of Chisels and Drawing Knives, and of Carriage Bands are, we believe, the only ones which are not now first published.

CATALOGUE OF THE HART, BLIVEN & MEAD MFG. CO.

Steel Squares—Electro Plated with Nickel. [p. 2

Per dozen	$66·00	48·00	44·00	40·00	35·00	33·50
Nos.	100	1	2	2½	3	4
Per dozen	$32·50	31·00	27·00	22·50	21·00	30·00
Nos.	5	6	8	10	11	12

Steel and Iron Rules.

No. 1, Steel Rules, 24x1½ inch .... ⅛, ¼, ₱ doz, $16·50
2, " 24x1½ " board measure, ⅛, ¼, ₱ doz. 18·00
3, " 24x1 " .... ⅛, ¼, " 13·00
4, Iron Rules, 24x1½ " marked on one side, ₱ doz. 3·50
5, " 24x1½ " marked on both sides, ₱ doz. 4·00
6, " 24x2 " marked on both sides, ₱ doz. 5·00

Steel and Iron Squares. [p. 3

Nos.	Names.	Width	Price	Description.
100	C. S., Improved	2 in.	$66 00	1-16, 1-12, 1-10, ⅛, ¼, with brace, 8 sq're and 1-100th scale, and Essex's new board measure, giving feet and inches in full.
1	C. S. for Drafting	2 "	48 00	1-16, 1-12, ⅛, ¼, board and brace measure, 8 sq're and 1-100th scale.
2	Cast Steel Finish	2 "	44 00	1-16, 1-12, ⅛, ¼, board and brace measure, and 8 square scale.
2½	Framing	2 "	40 00	⅛, ¼, both sides and edges.
3	Sup. Sup. Extra	2 "	35 00	1-16, 1-12, ⅛, ¼, board and brace measure.
4	Super Extra	2 "	33 50	1-12, ⅛, ¼, board and brace measure, extra figures on inner edge of body.
5	Extra	2 "	32 50	1-12, ⅛, ¼, board and brace measure.
6	A Brace	2 "	31 00	⅛, ¼, board and brace measure.
7	" B	2 "	30 00	⅛, ¼, b'd measure.
0	Culls of all above.		24 00	
8	Extra	1½ "	27 00	1-12, ⅛, ¼.
9	Plain	1½ "	25 50	⅛, ¼.
10	Extra, 1 foot	1½ "	22 50	1-12, ⅛, ¼.
11	Plain, 1 "	1½ "	21 00	⅛, ¼.
12	Cast Steel, 1 foot	1½ "	30 00	1-16, 1-12, ⅛, ¼, and 1-100th scale.
15	Bridge Builders'	3 "	180 00	1-16, 1-12, ⅛, 1 inch slot in center.
20	Machinists', 6 inch, Nickel Plated	1 "	13 50	1-16, 1-12, ⅛, ¼.

EAGLE SQUARES.

Nos.	Names.	Width	Price	Description.
13	A Brace	2 in.	$27 00	⅛, ¼, board and brace measure.
14	" B	2 "	25 50	⅛, ¼, b'd measure.

IRON SQUARES.

Nos.	Names.	Width	Price	Description.
1		1½ in.	$6 00	Marked on one side.
2		1½ "	10 00	Marked on both sides.
4		2 "	14 00	Marked on both sides.

Steel Squares .... packed four dozen in a case.
Iron " .... " eight "

Socket Firmer Chisels. [p. 4

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per dozen	$8·00	8·00	8·00	9·10	10·00	11·00	11·00
Inch	⅛	¼	⅜	½	⅝	¾	⅞
Per dozen	$12·00	13·00	13·00	14·00	15·00	16·00	
Inch	1	1⅛	1¼	1⅜	1½	2	

Assorted in Sets.

Per set	$7·75	8·25	11·25
Inch	⅛ to 1½ (9)	¼ to 2 (8)	⅛ to 2 (12)

No. 2, Stamped "French."

Per set	$7·75	8·25	11·25
Inch	⅛ to 1½ (9)	¼ to 2 (8)	⅛ to 2 (12)

Heavy Socket Corner Chisels.

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per dozen	$28·00	30·00	32·00	34·00	36·00
Inch	½	¾	1	1¼	1½

Socket Framing Chisels. [p. 5

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per doz.	$12·00	12·00	12·00	12·00	12·00	13·00	14·00	15·00	16·00
Inch	¼	5-16	⅜	7-16	½	⅝	¾	⅞	1
Per doz.	$18·00	18·00	20 00	22·00	24·00	28·00	32·00	36·00	40·00
Inch	1⅛	1¼	1½	1¾	2	2¼	2½	2¾	3

Carpenters' Slicks.

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per dozen	$40·00	44·00	48·00	52·00	60·00
Inch	2½	3	3½	3¾	4

Carpenters' Drawing Knives. [p. 6

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per dozen	$16·00	17·00	18·00	19·00	20·00	21·00
Inch	6	7	8	9	10	11
Per dozen	$22·00	24·00	25·00	26·00	28·00	
Inch	12	13	14	15	16	

Coach Makers' Drawing Knives.

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per dozen	$18·00	19·00	20·00	21·00	22·00	23·50	26·00
Inch	6	7	8	9	10	11	12

Wagon Makers' Drawing Knives. [p. 7

No. 1, or Extra, Stamped "Hart M'f'g Co."

Per dozen	$18·00	19·00	20·00	21·00	22·00	23·50	26·00
Inch	6	7	8	9	10	11	12

Farmers' Drawing Knives.

Stamped "Hart M'f'g Co."

Per dozen	$8·00	9·00	11·00	12·00	14·00	15·00	16·00	18·00
Inch	6	7	8	9	10	11	12	14

Shingle Knives.

Per dozen	$25·00	26·00	30·00
Inch	12	13	14

Socket Framing Chisel Handles. [p. 8

With Malleable Ferrules .... ₱ gross, $12·75

Shank Firmer Chisel Handles.

Hickory, assorted .... ₱ gross, $9·50
" " large .... " 11·50
Appletree " .... " 10·50
" " large .... " 12·75

Hickory Socket Firmer Chisel Handles.

Assorted .... ₱ gross, $6·75

File Handles.

Soft Wood, assorted .... ₱ gross, $6·50

Brad Awl Handles.

Appletree .... ₱ gross, $6·50

Coal Shovel Handles.

No. 1 .... ₱ gross, $4·50 | No. 2 .... ₱ gross, $5·50

Screw Drivers. [p. 9

Per dozen	$1·50	2·75	3·25	4·00	4·75	5·50	6·50
Inch	1½	2	3	4	5	6	7
Per dozen	$7·50	8·75	10·00	11·00	12·75	14·50	
Inch	8	9	10	12	14	16	

Socket Cast Steel Scratch Awls.

Appletree Handles .... ₱ dozen, $3·30

Scratch Awls.

Plain Beech Handles .... ₱ gross, $13·25

Ice Axe and Pick. [p. 10

No. 1, Part Polished .... ₱ dozen, $2·75
No. 2, All " .... " 3·30

Heavy Ice Picks.

No. 1, 6 inch, Solid Ferrules .... ₱ dozen, $2·65
No. 2, 7 " " " .... " 3·10

Cold Chisels.

Solid Cast Steel, ½ x 6 inch .... ₱ dozen, $3·75
" " " ⅝ x 7 " .... " 5·00
" " " ¾ x 9 " .... " 6·25
" " " assorted, 6, 7 and 9 inch .... " 5·25

Cast Steel Cheese and Butter Tryers.

Per dozen	$5·75	7·10	14·00	15·00	16·50
Inch	4	6	18	21	24

Cast Shoe Hammers. [p. 11

No. 1, Japanned, Half Polished, medium .... ₱ dozen, $3·30
No. 2, " " " large .... " 3·10

Cast Nail Hammers.

No. 1, Japanned, with Polished Face .... ₱ dozen, $2·50
No. 2, Full Polished .... " 2·75

Cast Adze Eye Nail Hammers.

No. 3, Japanned, with Polished Face .... ₱ dozen, $3·00
No. 4, Full Polished .... " 3·85

Upholsterers' Tack Hammers. [p. 12

Cast Iron, Polished Claws .... ₱ dozen, $2·25

Carpet Hammers.

No. 45, Cast Iron, Round Face, Cast Claw .... ₱ doz, $1·25
No. 48, " Octagon " " " .... " 1·65
No. 49, " Round " " Ex. Fin. .... " 2·00
No. 50, " " " St'l Claw " .... " 2·75
No. 10, Cast Steel " " " .... " 4·50

Cast Iron Shingling Hatchets.

No. 1, Small .... ₱ doz. $3·30 | No. 2, Medium .... ₱ doz. $4·40

Cast Steel Cotton Hooks. [p. 13

No. 1, White Handle, heavy .... ₱ dozen, $6·50
No. 2, Black " .... " 6·00
No. 3, White " .... " 5·50

Japanned Plumbers' Ladles.

Per dozen	$3·75	4·15	5·00	6·00	7·25	8·25	12·00
Nos.	1	2	3	4	5	6	7
Inches across bowl	2½	3	3½	4	4½	5	6

Japanned Box Chisels. [p. 14

Per dozen	$7·25	8·00	8·75
Inch	10	12	14

Cabinet Makers' Clamps.

No. 1, Japanned, Opens, 2¼ inches .... ₱ dozen, $1·35
No. 2, " " 2¾ " heavy .... " 1·55
No. 3, " " 4 " " .... " 2·65

Quilt Frame Clamps.

No. 1 (four constitute a set) .... ₱ dozen sets, $6·50

Wrought Iron Bench Screws. [p. 15

1 inch Screw, entire length, 15 inches .... ₱ dozen, $15·50
1⅛ " " " 16 " .... " 17·75
1¼ " " " 17 " .... " 21·00
1½ " " " 19 " .... " 32·00

Blacksmiths' Drills.

Japanned .... each, $7·75

Wood Handle Garden Forks. [p. 16

No. 1, Japanned, with Polished Points .... ₱ dozen, $3·00

Iron Handle Garden Forks.

No. 10, Japanned, with Polished Points .... ₱ dozen, $2·00

Iron Handle Garden Trowels.

No. 1, Japanned, with Polished Points .... ₱ dozen, $1·75

Patent Floral Sets.

Painted Green, Polished Points .... ₱ dozen sets, $17·75
Extra Full Polished .... " " 21·00

Japanned Plumb Bobs. [p. 17

No. 1, Iron .... ₱ dozen, $1·60
No. 5, " Extra Heavy (2½ lbs. each) .... " 8·00

Lead Plumb Bobs.

No. 4, Lead, Steel Pointed .... ₱ dozen, $7·20

Brass Plumb Bobs.

No. 2, Brass, Steel Pointed .... ₱ dozen, $7·00
No. 3, " " " Heavy (12 oz. each) " 9·00

Japanned Cast Iron Bolts. [p. 18

Brass Knob Barrel Bolts.

Per dozen	$1·00	1·12	1·45	1·80	2·12	2·45	3·25
Inch	3	4	5	6	7	8	10

Iron Knob Tower Bolts.

Per dozen	$0·80	1·12	1·45	1·75	2·12	2·75
Inch	4	5	6	7	8	10

Brass Knob Flat Shutter Bolts.

Per dozen	$0·80	·96	1·62	1·95	2·25	2·60	2·90	3·55
Inch	4	5	6	7	8	9	10	12

Steel Spring Square Bolts. [p. 19

Per dozen	$0·85	1·05	1·20	1·55	2·10	2·62	3·12	3·65	4·70
Inch	3	4	5	6	7	8	9	10	12

Steel Spring Square Necked Bolts.

Per dozen	$1·20	1·60	2·40	2·80	3·20
Inch	4	5	6	7	8

Japanned Lever Bolts.

Per dozen	$5·50	7·00	9·50
Inch	6	8	10

Japanned Chain Bolts. [p. 20

No. 1, without Back Plates.

Per dozen	$1·62	1·95	2·25	3·55	4·55	5·85
Inch	3	4	5	6	8	10

No. 2, Heavy, with Back Plates.

Per dozen	$5·50	7·00	9·30
Inch	6	8	10

No. 3, Extra Heavy, with Back Plates.

Per dozen	$5·50	6·00	6·50	8·50	12·00
Inch	4	5	6	8	10

Figured Enameled Barrel Bolts. [p. 21

No. 60, 3 inch, Packed with Screws .... ₱ dozen, $3·85
No. 70, 4 " " " " .... " 4·25
No. 80, 5 " " " " .... " 5·10

Figured Enameled Square Door Bolts.

No. 22, 3 inch, Packed with Screws .... ₱ dozen, $5·00
No. 24, 4 " " " " .... " 5·55

Figured Enameled Bottom Bolts. [p. 22

No. 10, 3 inch ..₱ doz., $4·25 | No. 12, 4 inch..₱ doz., $4·75

Figured Enameled Square Bolts.

No. 14, 3 inch ...₱ doz. $4·25 | No. 16, 4 inch...₱ doz. $4·75

Figured Enameled Chain Bolts. [p. 23

No. 18, 3 inch... ₱ doz. $5·50 | No. 21, 6 inch... ₱ doz. $7·25
No. 20, 4 " ... " 6·00 | No. 23, 8 " ... " 8·12

New Pattern Door Bolts. [p. 24

No. 1, 3 inch, Japanned, Porcelain Knob .... ₱ doz. $3·12
No. 2, 3 " Enameled, " " .... " 4·40
No. 3, 3 " Brass " " .... " 7·20
No. 4, 3 " German Bronzed, Porc. Knob .... " 8·75
No. 5, 3 " Olive Green B'nz'd " " .... " 10·00
No. 6, 3 " Silver Plated, Porcelain " .... " 10·50

Japanned Staples—For Square Bolts.

Per dozen	$0·32	·40	·55	·70
Inch	4 and 5	6 and 7	8 and 9	10, 11 and 12

Japanned Staples—For Plate Locks.

Per dozen	$0·60	·90
Inch	8 and 9	10, 11 and 12

Cast Brass Straight Cupboard Bolts.

No. 215, 2 inch ... ℔ dozen, $2·80
No. 216, 3 " extra heavy ... " 4·00

Brass Barrel Bolts—Heavy. [p. 25

All Brass, Brass Knob.		Iron Bolt, Brass Knob.	
No. 10, 3 inch .. ℔ doz.	$7·50	No. 20, 3 inch .. ℔ doz.	$7·00
No. 11, 3½ "	9·00	No. 21, 3½ "	8·00
No. 12, 4 "	10·00	No. 22, 4 "	9·00
No. 13, 5 "	11·50	No. 23, 5 "	10·50
No. 14, 6 "	14·00	No. 24, 6 "	12·00
All Brass, Porcelain Knob		Iron Bolt, Porcelain Knob	
No. 15, 3 inch .. ℔ doz.	$7·50	No. 25, 3 inch .. ℔ doz.	$7·00
No. 16, 3½ "	9·00	No. 26, 3½ "	8·00
No. 17, 4 "	10·00	No. 27, 4 "	9·00
No. 18, 5 "	11·50	No. 28, 5 "	10·50
No. 19, 6 "	14·00	No. 29, 6 "	12·00

Brass Barrel Bolts—Medium. [p. 26

All Brass, Brass Knob.		All Brass, Porc. Knob.	
No. 30, 2½ inch .. ℔ doz.	$5·50	No. 36, 2½ inch .. ℔ doz.	$5·50
No. 31, 3 "	6·00	No. 37, 3 "	6·00
No. 32, 3½ "	7·00	No. 38, 3½ "	7·00
No. 33, 4 "	8·00	No. 39, 4 "	8·00
No. 34, 5 "	9·00	No. 40, 5 "	9·00
No. 35, 6 "	10·00	No. 41, 6 "	10·00
Iron Bolt, Brass Knob.		Iron Bolt, Porc. Knob.	
No. 42, 2½ inch .. ℔ doz.	$5·00	No. 48, 2½ inch .. ℔ doz.	$5·00
No. 43, 3 "	5·50	No. 49, 3 "	5·50
No. 44, 3½ "	6·00	No. 50, 3½ "	6·00
No. 45, 4 "	7·00	No. 51, 4 "	7·00
No. 46, 5 "	8·00	No. 52, 5 "	8·00
No. 47, 6 "	9·00	No. 53, 6 "	9·00

Figured Enameled Cupboard Bolts.

No. 13, Packed with Screws ... ℔ dozen, $2·50

Flat Cupboard Bolts. [p. 27

No. 10, 2¼ inch, Japanned, Brass Knob ... ℔ doz. $1·20
No. 11, 2½ " " Porcelain Knob .. " 1·50
No. 12, 3½ " " " " 1·70
No. 279, 2¼ " Cast Brass, Brass Knob ... " 5·00
No. 280, 3½ " " " " 6·50
No. 281, 2¼ " " Porcelain Knob. " 5·00
No. 282, 3½ " " " " 6·50
No. 283, 2¼ " Silver Plated, Plated " .. " 8·40
No. 284, 2¼ " " " Porc'l'n " .. " 8·40
No. 285, 3½ " " " " " 14·00

Mortise Front Door Bolts.

No. 10, All Brass, Brass Knob ... ℔ doz. $8·00
No. 20, " Porcelain Knob ... " 8·50
No. 30, Iron, with Brass Shank & Porc. Knob " 5·00
No. 40, " " " " Brass " .. " 4·50
No. 110, Brass, Brass Knob, Full Plated ... " 15·00
No. 120, " Porcelain Knob, Full Plated .. " 15·00

Cast Brass Square Door Bolts. [p. 28

Cast Brass, Brass Knob.
No. 20, 2½ inch, Polished and Lacquered ... ℔ doz. $7·00
No. 30, 3 " " " ... " 9·00
No. 40, 4 " " " ... " 11·50

Silver Plated, Plated Knob.
No. 25, 2½ inch, Packed with Screws ... ℔ doz. $13·00
No. 35, 3 " " " ... " 15·50
No. 45, 4 " " " ... " 18·00

Cast Brass, Porcelain Knob.
No. 50, 2½ inch, Polished and Lacquered ... ℔ doz. $7·00
No. 60, 3 " " " ... " 9·00
No. 70, 4 " " " ... " 11·50

Silver Plated, Porcelain Knob.
No. 80, 2½ inch, Packed with Screws ... ℔ doz. $13·00
No. 90, 3 " " " ... " 15·50
No. 100, 4 " " " ... " 18·00

Cast Brass Flat Ship Bolts. [p. 29

Per dozen	$2·90	3·30	4·40	5·60
Inch	2	2½	3	3½

Cast Brass Square Spring Bolts.

Per dozen	$6·00	8·00	10·00	12·00
Inch	3	4	5	6

Cast Brass Square Necked Bolts.

Per dozen	$7·50	9·50	12·00	14·00
Inch	3	4	5	6

Cast Brass Flush Bolts. [p. 30

⅜ Inch Wide.

Per dozen	$0·90	1·00	1·20	1·40	1·60
Inch	2	2½	3	3½	4

½ Inch Wide, Medium.

Per dozen	$1·40	1·60	1·80	2·20	2·50	3·00
Inch	2½	3	3½	4	5	6

⅝ Inch Wide.

Per dozen	$2·60	2·80	3·20	3·80	5·50	6·50
Inch	3	4	5	6	8	10

¾ Inch Wide.

Per dozen	$3·20	3·60	4·20	5·00	6·00	7·00	8·00	9·50	12·00
Inch	4	5	6	7	8	9	10	12	15

1 inch Wide.

Per dozen	$7·50	9·00	11·00	13·50	16·00	20·00	25·00
Inch	6	8	10	12	15	18	24

Heavy Cast Brass Chain Bolts. [p. 31

Cast Brass.
No. 100, 2 inch, Polished and Lacquered ... ℔ dozen, $10·00
No. 101, 3 " " " ... " 12·00
No. 102, 4 " " " ... " 14·50

Silver Plated.
No. 200, 2 inch, Packed with Screws ... " $15·75
No. 201, 3 " " " ... " 19·00
No. 202, 4 " " " ... " 22·00

Medium Cast Brass Chain Door Fasteners. [p. 32

No. 50, 4 inch, Polished and Lacquered ... ℔ dozen, $11·50
No. 60, 6 " " " ... " 17·00
No. 70, 8 " " " ... " 22·50

Silver Plated.
No. 55, 4 inch, Plated with Screws ... " $21·50
No. 65, 6 " " " ... " 33·50
No. 75, 7 " " " ... " 43·00

Cast Brass Chain Door Fasteners. [p. 34

Cast Brass, Extra Heavy.
No. 80, 4 inch, Polished and Lacquered .. ℔ dozen, $22·50
No. 90, 6 " " " ... " 28·00
No. 100, 8 " " " ... " 34·00
No. 110, 10 " " " ... " 42·00

Silver Plated, Extra Heavy.
No. 180, 4 inch, Packed with Screws ... ℔ dozen, $44·00
No. 190, 6 " " " ... " 55·00
No. 200, 8 " " " ... " 66·00
No. 210, 10 " " " ... " 77·00

Japanned Chain Door Fasteners—Medium.

No. 25, 4 inch ... ℔ dozen, $3·50
No. 30, 6 " ... " 4·00
No. 40, 8 " ... " 5·00

Figured Enameled Cupboard Latches.

No. 330, Metal Knob, Packed with Screws .. ℔ dozen, $2·40
No. 335, Porcelain " " " .. " 2·40

Japanned Rural Cupboard Catches. [p. 35

Per gross	$9·50	10·50	12·00	Per gross	$13·00	14·00	16·00
Nos	1	2	3	Nos	4	5	6
Per gross	$10·00	10·50	11·50				
Nos	7	8	9				

Square Plate. [p. 36
No. 10, Japanned, Porcelain Knob ... ℔ gross, $16·00
No. 11, " " " ... " 16·50
No. 12, " " " ... " 17·00

Figured Enameled Cupboard Catches.

No. 317, Packed with Screws ... ℔ dozen, $2·70

New Pattern Closet Catches. [p. 37

No. 200, Japanned Iron, Porcelain Knob .. ℔ dozen, $1·35
No. 201, " " " " 1·65
No. 202, " " " " 1·90
No. 203, Fancy Brass, " " " 3·75
No. 204, " " " " 4·80
No. 205, " " " " 5·90
No. 206, " Olive Green Bronzed, Porcelain Knob ... " 4·40
No. 207, Fancy Brass, Olive Green Bronzed, Porcelain Knob ... " 5·50
No. 208, Fancy Brass, Olive Green Bronzed, Porcelain Knob ... " 6·60

Packed with screws.
No. 209, Figured Enameled, Porcelain Knob .. ℔ doz. $2·75
No. 210, " " " " 3·30
No. 211, " " " " 3·85
No. 212, F'cy Brass, S'ver Plated, Porc'n Knob " 5·00
No. 213, " " " " 6·00
No. 214, " " " " 7·00

Figured Enameled French Window Catches.

No. 315, 1½ inch, Packed with Screws ... ℔ dozen, $2·15
No. 316, 2 " " " ... " 2·50

French Window Catches. [p. 38

No. 307, 1½ inch, Plain Brass, Polished, Porcelain Knob ... ℔ dozen, $4·00
No. 308, 2 inch, Plain Brass, Polished, Porcelain Knob ... " 5·00
No. 309, 1½ inch, Silver Plated, Porcelain Knob, Packed with Screws ... " 6·25
No. 310, 2 inch, Silver Plated, Porcelain Knob, Packed with Screws ... " 8·50
No. 311, 1½ inch, Pl'n Jap'd, Porcel'n Knob " 1·12
No. 312, 2 " " " " 1·25
No. 313, 1½ " Plain Brass, Olive Green Bronzed, Porcelain Knob ... " 5·50
No. 314, 2 inch, Plain Brass, Olive Green Bronzed, Porcelain Knob ... " 7·00
No. 302, Fancy Brass, Porcelain Knob ... " 5·50
No. 303, Silver Plated, Porcelain Knob, Packed with Screws ... " 7·20
No. 304, Olive Green Bronzed, Porc'n Knob " 6·35
No. 305, Fancy Iron, Antique Bronzed, Porcelain Knob ... " 1·80
No. 306, F'cy Iron, Japanned, Porc'n Knob. " 1·50

Figured Enameled Flush Cupboard Catches. [p. 39

No. 425, Packed with Screws ... ℔ dozen, $2·20

Figured Enameled Cupboard Turns.

No. 320, Packed with Screws ... ℔ dozen, $6·50

Rural Cast Brass Closet Catches. [p. 40

No. 20, Plain Brass, Polished, Porc'n Knob .. ℔ doz. $5·00
No. 25, " " " " 5·80
No. 30, Silver Plated, Porcelain Knob, Packed with Screws ... " 8·75
No. 35, Silver Plated, Porcelain Knob, Packed with Screws ... " 10·50
No. 40, Olive Green Bronzed, Porcelain Knob " 8·00
No. 45, " " " " 9·50

Wrought Brass Plate Cupboard Catches.

Per gross	$16·00	18·00	22·00	25·00
Nos	0	1	2	3

Cast Brass Plate Cupboard Catches.

Per gross	$25·00	30·00	36·00	42·00
Nos	16	17	18	19

Wrought Brass Plate Cupboard Catches. [p. 41

Per gross	$20·00	22·00	25·00	28·00
Nos	4	5	6	7

Cast Brass Plate Cupboard Catches.

Per gross	$31·00	36·00	40·00	46·00
Nos	8	9	10	11

Cast Brass Silver Plated Cupboard Catches.

Per gross	$43·00	56·00	62·00	72·00
Nos	12	13	14	15

Brass Show Case Catches.

No. 5, Wr't Brass, Cast Brass Thumb Piece. ℔ gross, $15·50
No. 6, " " " " 17·50
No. 7, " " " " 20·00
No. 8, " " " " 22·50

Flush Ring Show Case Catches. [p. 42

No. 214, Cast Brass, Polished and Lacquered .. ℔ doz. $4·70
No. 215, " Silver Plated, Packed with Screws ... " 9·00

Cast Brass Flush Rings.

Per dozen	$1·80	2·00	2·40	2·60	2·80
Inch	1	1⅛	1¼	1⅜	1½

Japanned Door Buttons.

Per gross	$0·80	0·90	1·10	1·40
Inch	1¼	1½	1¾	2

Japanned Raised Door Buttons.

Per gross	$1·00	1·20	1·50	2·20
Inch	1½	1¾	2	2¼

Brass Door Buttons. [p. 43

Per gross	$4·50	5·00	6·00	6·50
Inch	1¼	1½	1¾	2

Figured Enameled Door Buttons.

No. 4, 1¾ inch, Packed with Screws ... ℔ gross, $8·25
No. 5, 2 " " " ... " 9·50

Door Buttons on Plates.

Japanned.					Brass.			
Per gross	$3·50	4·00	4·50	6·00	Per gross	$14·00	15·50	18·00
Inch	1½	1¾	2	2½	Inch	1½	1¾	2

Brass Drive Hooks—No. 35. [p. 44

Per gross	$2·65	2·85	3·85	4·70	5·50	6·60	7·70	9·35
Inch	½	⅝	¾	1	1¼	1½	1¾	2

Brass Screw Hooks—No. 25.

Per gross	$3·10	3·30	4·20	5·25	6·60	7·70	8·80	10·40
Inch	½	⅝	¾	1	1¼	1½	1¾	2

Acorn Tip, Brass Screw Hooks—No. 45.

Per gross	$8·15	8·70	9·50	10·00	10·60	12·00	15·40	18·70	23·00
Inch	1	1¼	1½	1¾	2	2½	3	3½	4

Japanned Wardrobe Hooks. [p. 45

Per gross	$0·90	1·00	1·15	1·80	Per gross	$1·80	2·25	2·88
Nos	1	2	3	4	Nos	5	6	7
Per gross						$1·80	2·25	2·88
Nos						8	9	10

Curved Wardrobe Hooks—Double. [p. 46

No. 013, Japanned ... ℔ gross, $2·50
No. 014, Coppered ... " 2·75

Brass Wardrobe Hooks.

No. 405 ... ℔ dozen, $1.15
No. 406 ... " 1·25

Curved Wardrobe Hooks—Japanned.

Per gross	$1·35	1·80	2·40
Nos	12	13	15

Figured Enameled Ceiling Hooks. [p. 47

No. 60, Wrought Screw ... ℔ dozen, $1·65

Hat Rack Pins.

No. 20, Cast Brass, Silver Plated, Wr't Screw. ℔ doz. $9·00
No. 25, " " " " 9·00

Ceiling Hooks. [p. 48

No. 1, Japanned, Wrought Screw ... ℔ gross, $4·00

Double Ceiling Hooks.

No. 2, Japanned, Cast Screw ... ℔ gross, $2·25
No. 102, Coppered, " ... " 3·00

Double Ceiling Hooks. [p. 49

No. 11, Japanned ... ℔ gross, $4·50

Clothes Line Hooks.

No. 1, Japanned ... ℔ gross, $18·00
No. 2, " ... " 10·75
No. 3, " ... " 8·00
No. 10, Galvanized ... " 36·00
No. 20, " ... " 21·50
No. 30, " ... " 16·00

Hotel or School House Hooks. [p. 50

No. 1, Japanned, Single Hook ... ℔ gross, $6·25
No. 2, Japanned, Double Hook ... " 8·00
No. 3, Japanned, Triple Hook ... " 8·00

Hat and Coat Hooks. [p. 51

No. 24, Japanned ... ℔ gross, $4·50
No. 124, Coppered ... " 5·40
No. 23, Japanned, larger size and heavy ... " 5·00
No. 123, Coppered ... " 6·00
No. 60, Fig'd Enam'd, Packed with Screws. " 10·00
No. 45, Fig'd Enam'd, Packed with Screws. " 12·00
No. 50, Fig'd Enam'd, Packed with Screws. " 17·50

Japanned.	℔ gross.	Coppered.	℔ gross.
No. 18, Cast Screw	$2·15	No. 118, Cast Screw	$2·50
No. 19, " "	2·50	No. 119, " "	3·00
No. 20, " "	2·80	No. 120, " "	3·40
No. 21, " "	3·25	No. 121, " "	4·00

No. 9, Japanned, Cast Screw ... ℔ gross, 3·50
No. 109, Coppered, " ... " 4·00
No. 15, Japanned ... " 3·60
No. 10, Japanned ... " 3·40
No. 110, Coppered ... " 4·00

	℔ gross.		℔ gross.
No. 11, Japanned	$5·40	No. 111, Coppered	$4·00
No. 12, "	4·30	No. 112, "	5·00
No. 25, "	3·60	No. 125, "	4·30
No. 26, "	5·00	No. 126, "	5·75
No. 27, "	5·75	No. 127, "	6·75

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No. 14, Japanned ... ℔ gross, $5·50
No. 114, Coppered ... " 6·50

Cast Brass Hat and Coat Hooks.

No. 420, Cast Brass ... ℔ dozen, $3·00
No. 425, " " Porcelain Knobs ... " 5·00

[p. 58
No. 426, Cast Brass, Porcelain Knobs ... ℔ dozen, $5·75
No. 427, " " " ... " 6·00
No. 428, " " " ... " 7·25

Japanned Harness Hooks. [p. 59

No. 12, 8 inch ... ℔ gross, $23·50
No. 13, 6 " ... " 21·50
No. 14, 5½" ... " 19·35
No. 15, 4½" ... " 16·25

Japanned Lamp Hooks. [p. 60

Per gross	$2·30	2·60	3·00	3·40	4·50	5·50	7·00
Nos	1	2	3	4	5	6	7
Inch	1¼	1½	1¾	1⅞	2	2¼	2½

Cast Brass Lamp Hooks.

Per gross	$9·00	12·00	13·50	15·00	18·00	23·00	30·00
Nos	1	2	3	4	5	6	7
Inch	1¼	1½	1¾	1⅞	2	2¼	2½

Cast Brass Cabin Door Hooks.

Per dozen	$2·90	3·25	3·60	4·40	4·65	5·25
Inch	2½	3	3½	4	4½	5

Fancy Bird Cage Hooks. [p. 61

7 Inch.	℔ doz.	8 Inch.	℔ doz.
Japanned	$1·65	Japanned	$1·65
French Bronze on Iron	2·00	French Bronze on Iron	2·00
Cast Brass	3·90	Cast Brass	4·50
Silver Plated	5·50	Silver Plated	6·00

No. 5, 7 inch, Cast Brass, Polished and Lacquered, per dozen ... $4·25

Cottage Bird Cage Hooks.

No. 1, Gold Bronzed, assorted colors ... ℔ dozen, $3·75
No. 2, Figured, Enameled ... " 4·00

Figured Enameled Bird Cage Hooks. [p. 62

No. 10, 8 inch, Wrought Iron Screw ... ℔ dozen, $2·25

Paper Clips.

No. 1, Figured Enameled ... ℔ dozen, $2·50
No. 2, Bronze Metal ... " 6·50

Pen Racks.

No. 20, Pen Racks, Figured Enameled ... ℔ dozen, $2·25

Paper Files. [p. 63

No. 5, Figured Enameled ... ℔ dozen, $2·50
No. 1, Japan'd or Gold Bronzed, assrt'd col'r " 1·65
No. 2, Figured Enameled ... " 2·25
No. 3, " " ... " 1·75

Spiral Spring Gate Latches. [p. 64

No. 1, Latch Riveted, to swing one way ... ℔ dozen, $2·20
No. 2, " " both ways .. " 2·50
No. 3, Latch not Riveted, to swing one way " 2·00
No. 4, " " " both ways " 2·20

Right and Left Gate Hinges.

No. 1, To swing both ways, with Latch complete, per set ... $0·88

New England Gate Hinges. [p. 65

No. 2, Right or Left Hand, with Latch complete, per set ... $1·05

New York State Gate Hinges.

No. 3, Reversible, Wrought Iron Pins, with Latch complete, per set ... $0·66

Japanned Fast Joint Plate Hinges. [p. 66

Per pound	$0·22	0·22	0·19	0·19	0·19	0·19	0·19
Inches long	6	8	10	12	14	16	18
Inches wide	¾	¾	⅞	⅞	1	1	1⅛
Per pound	$0·19	0·19	0·19	0·19	0·19	0·19	
Inches long	20	22	24	28	30	36	
Inches wide	1¼	1⅜	1½	1¾	1¾	2	

Japanned Loose Joint Plate Hinges.

Per pound	$0·22	0·22	0·19	0·19	0·19	0·19	0·19
Inches long	6	8	10	12	14	16	18
Inches wide	¾	¾	⅞	⅞	1	1	1⅛
Per pound	$0·19	0·19	0·19	0·19	0·19	0·19	
Inches long	20	22	24	28	30	36	
Inches wide	1¼	1⅜	1½	1¾	1¾	2	

Japanned Barn Door Rollers.

Per pair	$0·75	1·00	1·25	2·15	3·30	4·50	6·50
Inch	4	5	6	8	10	12	16

New Pattern.

Per pair	$0·55	0·75	1·00	1·30	2·00
Inch	3	4	5	6	8

Extra Heavy.

Per pair	$0·45	0·65	0·90	1·25	1·40	2·20	3·00
Inch	2½	3	4	5	6	8	10

New England Pattern, with Square Groove Wheels.

Per pair	$1·15	1·60	2·10	2·70
Inch	3	4	5	6

Barn Door Rail. [p. 68

For Round Groove Wheels.
No. 0, ½ inch, for Small Wheel ... ℔ foot, $0·10½
No. 1, ⅝ " Medium Wheels ... " 0·14
No. 2, ⅞ " Large Wheels ... " 0·21½
For New England, with Square Groove Wheels.
No. 3, Flat, for 3 and 4 inch Wheels ... ℔ foot, $0·11
No. 4, " 5 " 6 " ... " 0·12
No. 5, Angular ... " 0·10

Barn Door Stays.

No. 2, To Screw ... ℔ dozen, $4·20

Sliding Door Rail.

1½ inch, Painted Drab ... ℔ foot, $0·10

Sliding Door Sheaves. [p. 69

Iron Case, Iron Wheels, Brass Rivets.

Per set	$0·88	1·20	1·37	1·90	2·50	3·00
Inch	1¾	2¼	3	4	5	6

Iron Case, Brass Wheels, Brass Rivets.

Per set	$1·55	2·50	2·75	3·85	5·50	7·75
Inch	1¾	2¼	3	4	5	6

Japanned Barn Door Pulls.

No. 1 ... ℔ dozen, $1·10
No. 2 ... " 1·75

Japanned Foot Scrapers. [p. 70

No. 1, for Wood ... ℔ dozen, $2·50
No. 2, " ... " 2·00
No. 3, " Stone ... " 2·25
No. 4, " Wood ... " 2·00
No. 5, Dish Foot Scraper ... " 9·00
No. 7, for Wood ... " 1·40

Frame Pulleys. [p. 71

No. 0, 1¾ inch, with Wrought Pin ... ℔ dozen, $0·64
Extra Heavy.
No. 1, 1¾ in., Painted Face, Turned Wheels, Polished ... ℔ dozen, $1·30
No. 2 inch, Painted Face, Turned Wheels, Polished ... ℔ dozen, $1·45

Axle Pulleys. [p. 72

No. 5, 1¾ inch ... ℔ dozen, $1·20
No. 10, 2 " ... " 1·32
No. 15, 2¼ " ... " 1·70
No. 20, 2½ " ... " 2·30
Heavy.
No. 25, 1¾ inch, with Full Size Wheels ... ℔ dozen, $1·35
No. 30, 2 " " " " ... " 1·50
No. 35, 1¾ inch, with Full Size Turned Wheels, Polished ... ℔ dozen, $1·45
No. 40, 2 inch, with Full Size Turned Wheels, Polished ... ℔ dozen, $1·60
No. 45, 2¼ inch, Extra Heavy, Full Size Turned Wheels, Polished ... ℔ dozen, $2·75
[p. 73
No. 50, 1¾ inch ... per dozen, $0·80
No. 55, 2 " ... " 1·00
No. 60, 2¼ " ... " 1·45

Japanned Side Pulleys.

Per dozen	$1·10	1·35	1·65	3·00	4·50	6·00
Inch	1½	1¾	2	2½	3	3½

Japanned Incased Screw Pulleys. [p. 74

3 inch, Heavy ... ℔ dozen, $4·00

Japanned Screw Pulleys.

1¼ inch ... ℔ dozen, $0·68
1¾ " ... " 0·82
2 " ... " 1·10
2½ " ... " 2·50
3 " ... " 3·00
3½ " ... " 4·00
1¾ " Double ... " 1·50

Japanned Upright Pulleys. [p. 75

Per dozen	$1·10	1·30	2·00	4·00	6·00
Inch	1¾	2	2¼	2½	3

Japanned Yard Line Pulleys.

2½ inch ... ℔ dozen, $2·00 | 3 inch ... ℔ dozen, $2·80

Japanned Tackle or Awning Pulleys. [p. 76

Single.		Double.	
2 inch ... ℔ dozen,	$2·20	2 inch ... ℔ dozen,	$3·50
3 " ... "	5·70	3 " ... "	7·20

Japanned Hot House Pulleys. [p. 77

Single.		Double.	
1¾ inch ... ℔ dozen,	$1·88	1¾ inch ... ℔ dozen,	$3·12
2 " ... "	2·38	2 " ... "	3·62
2¼ " ... "	3·37	2¼ " ... "	5·12
2½ " ... "	4·25		

Sash Cord Irons. [p. 78

Japanned ... ℔ gross, $0·90

Sash Lifts.

No. 25, Cast Brass, Lacquered ... ℔ gross, $11·00
No. 30, " " Silver Plated, Packed with Screws ... " 25·00
No. 40, Cast Brass, Olive Green Bronzed ... " 23·00
No. 50, Heavy Cast Brass, Lacquered ... " 24·00
No. 60, " " Silver Plated, Packed with Screws ... " 48·00
No. 70, Heavy Cast Brass, Olive Green Bronzed ... " 45·00
No. 80, Figured Enameled, Packed with Screws ... " 7·50
No. 85, Figured Enameled, Packed with Screws ... " 8·50
[p. 79
No. 90, Figured Enameled, Packed with Screws ... " 16·25

Sash Centers.

No. 1, Japanned ... ℔ gross, $3·15
No. 2, " Extra Heavy, ⅜ inch Pin ... " 7·25

Japanned Sash Rollers. [p. 80

Width of Wheel ⅜ inch ... ℔ gross, $3·15
" " ½ " ... " 3·75
" " ⅝ " ... " 5·50
" " ¾ " ... " 7·50
" " ⅞ " ... " 10·00
No. 10, Extra Heavy, width of Plate 1½ in. .. " 15·50

Japanned Trunk Rollers.

Width of Wheel ½ inch ... ℔ gross, $5·50
" " ⅝ " ... " 6·75

Window Springs. [p. 81

No. 5, Brass Bolt and Thumb Pieces, Wr'ght Iron Plate ... ℔ gross, $11·00
No. 6, Iron Bolt and Thumb Piece, Wro'ght Iron Plate ... " 7·50

Window Spring Bolts.

No. 1, Zinc Case, Coppered ... ℔ gross, $2·90
No. 1, " Japanned ... " 2·90
No. 3, " Silver Capped ... " 3·80

Sash Props or Fasteners.

Eccentric Pattern, Japanned ... ℔ gross, $1·38
Y Pattern, Japanned ... " 2·75

Three Hole Shutter Lifts. [p. 82

Three Hole, Japanned ... ℔ gross, $3·00

Flush Shutter Lifts.

Flush, Japanned ... ℔ gross, $4·50

Japanned Stubs and Plates.

Round Hole, Heavy ... ℔ gross, $4·50
Square " " ... " 4·00

Japanned Shutter Screws. [p. 83

Per gross	$12·15	13·30	13·60	14·00	15·50
Inch	1¾	2	2¼	2½	3

Japanned Shutter Bars.

4 inch ... ℔ gross, $5·50 | 6 inch ... ℔ gross, $12·00

Figured Enameled Shutter Bars.

No. 20, 2 inch, Packed with Screws ... ℔ dozen, $1·00
No. 20, 2½ " " " ... " 1·10
No. 20, 3 " " " ... " 1·30

Boston Pattern Shutter Hooks. [p. 84

Burnished Brass.

Per dozen	$2·00	2·20	2·50	2·80
Inch	1¾	2	2½	3

Silver Plated—Packed with Screws.

Per dozen	$2·80	3·20	4·00	5·00
Inch	1¾	2	2½	3

Improved New York Pattern Shutter Bars.

Burnished Brass.

Per dozen	$2·30	2·60	3·00	3·50	4·00
Inch	1¾	2	2½	3	3½

Silver Plated—Packed with Screws.

Per dozen	$6·00	6·50	7·00	7·50	9·00
Inch	1¾	2	2½	3	3½

Hart Pattern Shutter Bars.

Burnished Brass.

Per dozen	$2·75	3·00	3·50	4·00	4·50
Inch	1¾	2	2½	3	3½

Silver Plated—Packed with Screws.

Per dozen	$6·50	7·00	7·50	8·00	8·50
Inch	1¾	2	2½	3	3½

Sash Fasteners. [p. 86

No. 1, Japanned, Brass Capped Screw ... ℔ dozen, $0·80
No. 3, Cast Brass " " ... " 4·50
No. 2, Jap'd, Brass Capped Knob & Rivet .. " 1·20
No. F, Japanned, Porcelain Knob and Brass Capped Screw ... " 1·90
No. G, Cast Brass, Porcelain Knob and Brass Capped Screw ... " 5·50
No. 9, Silver Plated, Porc. Knob, Packed with Screws ... " 10·00
No. D, Silver Plated, Packed with Screws. ℔ dozen, $10·00
No. 3, " " Porc. Knob, Packed with Screws ... " 10·00
Boston Pattern, Extra Heavy.
No. 10, Cast Brass, Lacquered ... " 6·00
No. 15, Silver Plated, Packed with Screws. " 10·00
No. 20, Olive Green Bronzed ... " 7·00
Extra Heavy. [p. 87
No. 25, Cast Brass, Lacquered, Porc. Knob. " $8·00
No. 30, Silver Plated, Porc. Knob, Packed with Screws ... " 12·00
No. 35, Olive Green Bronzed, Porc. Knob. " 11·00
No. 40, Cast Brass, Lacquered ... " 8·50
No. 45, Silver Plated, Packed with Screws " 13·00
No. 50, Olive Green Bronzed ... " 12·00
No. 55, " " Plated Acorn Knobs ... " 12·50
[p. 88

Figured Enameled Sash Fasteners—With Metal Knobs.

No. 75, Packed with Screws ... ℔ dozen, $3·00
No. 70, " " ... " 6·00

Figured Enameled Drawer Pulls. [p. 89

No. 70, 3 inch ... ℔ gross, $12·00
No. 80, 4 " ... " 14·00
No. 90, 3 " ... " 12·00
No. 100, 4 " Packed with Screws ... " 14·00
[p. 90
No. 50, 3 " " " ... " 11·00
No. 60, 4 " " " ... " 13·00

Drawer Pulls.

No. 20, 4 inch, Iron, Japanned ... ℔ gross, $7·25
No. 30, 4 " " Antique, Bronzed ... " 8·50
No. 2000, 4 " Brass, Lacquered ... " 53·00
No. 2001, 4 inch, Brass, Olive Green Br'zed " 53·00
No. 2002, 4 " " S'ver Plated, P'ked with Screws ... " 73·00
[p. 91
No. 3, 4 inch, Japanned ... " 6·80
No. 103, 4 " Coppered and Varnished. " 8·00
No. 303, 4 " Black and Gold Bronzed. " 11·00
No. 603, 4 " All Gold Bronzed ... " 13·00
No. 3½, 3 " Japanned ... " 5·00
No. 103½, 3 " Coppered and Varnished. " 6·00
No. 303½, 3 " Black and Gold Bronzed .. " 8·00
No. 603½, 3 " All Gold Bronzed ... " 10·00
No. 4, 4 " Japanned ... " 6·00
No. 104, 4 " Coppered and Varnished. " 7·50
[p. 92
No. 7, 4 " Japanned ... " 5·50
No. 107, 4 " Coppered and Varnished. " 7·00
No. 307, 4 " Black and Gold Bronzed .. " 10·00
No. 6, 4 " Japanned ... " 6·50
No. 106, 4 " Coppered and Varnished. " 8·00
No. 306, 4 " Black and Gold Bronzed .. " 11·00
No. 606, 4 " All Gold Bronzed ... " 13·00
No. 6½, 3 " Japanned ... " 5·00
No. 106½, 3 " Coppered and Varnished " 6·00
No. 306½, 3 " Black and Gold Bronzed .. " 8·00
No. 606½, 3 " All Gold Bronzed ... " 10·00
[p. 93
No. 5, 4 " Japanned ... " 4·50
No. 105, 4 " Coppered and Varnished. " 6·00
No. 5½, 3 " Japanned ... " 4·00
No. 105½, 3 " Coppered and Varnished. " 5·50
No. 5¼, 2½" Japanned ... " 3·50
No. 105¼, 2½" Coppered and Varnished. " 5·00

Japanned Lifting Handles.

No. 1, Riveted ... ℔ dozen pairs, $1·20
No. 2, " ... " " 1·40
No. 3, " ... " " 1·60

Japanned French Window Shutter Handles. [p. 94

No. 1, Length of Plate, 6 in., Japanned. ℔ doz. p'rs, $3·00
No. 2, " " 6½ " " " 3·50
No. 3, " " 7 " " " 4·00

Brass Lifting Handles.

Cast Brass.
No. 10, 2½ inch, Polished and Lacquered. ℔ doz. p'rs, $5·00
No. 11, 3 " " " " 6·60
No. 12, 3½ " " " " 8·00
No. 13, 4 " " " " 11·50
Silver Plated.
No. 14, 2½ inch, Packed with Screws ... ℔ doz. pairs, $8·00
No. 15, 3 " " " ... " 10·00
No. 16, 3½ " " " ... " 12·00
No. 17, 4 " " " ... " 15·50

Japanned Wrought Chest Handles. [p. 95

Per dozen pairs	$2·25	2·63	3·00	3·38	3·75	4·12
Nos	1	2	3	4	5	6

Door Pulls.

No. 5, Japanned ... ℔ dozen, $0·70
No. 15, Fig'd Enam'd, Packed with Screws. " 1·80

Cast Brass Door Pulls. [p. 96

No. 10, Fancy Brass, Lacquered ... ℔ dozen, $3·00
No. 20, " Silver Plated, Packed with Screws ... " 5·50
No. 30, Heavy Plain Flat Brass, Lacquered. " 4·50
No. 40, " S'ver Plated, Packed with Screws ... " 6·50

Japanned Thumb Latches. [p. 97

Light.			Heavy.		
No. 0	℔ dozen,	$0·75	No. 0	℔ dozen,	$0·90
No. 1	"	0·95	No. 1	"	1·10
No. 2	"	1·12	No. 2	"	1·30
No. 3	"	1·30	No. 3	"	1·50
No. 4	"	1·45	No. 4	"	1·70

Figured Enameled Door Handles. [p. 98

For either Right or Left Hand Doors.
No. 90, Packed with Screws ... ℔ dozen, $4·00

Japanned Pittsburgh Thumb Latches. [p. 99

No. 100 ... ℔ dozen, $1·30

Japanned Barn Door or Gate Latches.

No. 15, Heavy Wrought Latch ... ℔ dozen, $3·00

Japanned Barn Door Latches. [p. 100

No. 25, Large and Heavy Wrought Latch ... ℔ dozen, $5·00

Oblique Store Door Handles. [p. 101

No. 10, Japanned, Plain ... ℔ dozen, $2·75
No. 20, " Plate only ... " 3·75
No. 30, " " and Screw ... " 5·75
No. 130, Brass, Polished, Plate and Screw .. " 48·00
No. 230, Silver Plated, Plate and Screw, Packed with Screws ... " 92·00
[p. 102
No. 180, Figured Enameled, Packed with Screws ... ℔ dozen, $8·00
[p. 103
No. 70, Ornamental Bronze Metal, Packed with Screws ... ℔ dozen, $56·00
No. 80, Figured Enameled, Packed with Screws ... " 10·75
[p. 104
Beveled Edges.
No. 40, Cast Brass, Extra Polished and Lacquered ... ℔ dozen, $61·00
No. 50, Cast Brass Electro-Plated, Packed with Screws ... " 103·00

Figured Enameled Surface Chest Handles. [p. 105

No. 50, Packed with Screws ... ℔ dozen pairs, $4·50
No. 60, " " ... " 5·87
No. 70, " " ... " 8·00

Japanned Surface Chest Handles. [p. 106

No. 23, Heavy ... ℔ dozen pairs, $3·00
No. 24, " ... " 5·00
No. 25, " ... " 7·00

Japanned Flush Chest Handles. [p. 107

No. 1, Heavy ... ℔ dozen pairs, $6·50
No. 2, " ... " 7·50

Japanned Flush Drawer Handles. [p. 108

No. 1, Heavy, Riveted ... ℔ dozen pairs, $2·80
No. 2, " " ... " 3·60

Japanned Flush Trap Door Rings.

No. 1, Heavy, Riveted ... ℔ dozen, $2·00
No. 2, " " ... " 2·50
No. 3, " " ... " 3·50

Brass Thread Escutcheons. [p. 109

Common.

Per gross	$0·80	0·85	0·90	1·00	1·10	1·20	1·30
Inch	⅜	7-16	½	9-16	⅝	11-16	¾

Heavy.

Per gross	$0·90	0·95	1·00	1·10	1·20	1·40	1·50
Inch	⅜	7-16	½	9-16	⅝	11-16	¾

Japanned Bed Keys.

No. 1, Three Sockets and Screw Driver ... ℔ dozen, $1·60
No. 2, " Steel Screw Driver " 1·90
No. 4, Japanned, Y Pattern ... " 1·60
No. 5, " Z " ... " 1·00

Bedstead Fastenings. [p. 110

No. 1, Jenny Lind, Single ... ℔ set, $0·31
No. 1½, " Double ... " 0·35
No. 3, California Pattern ... " 0·40
No. 6, 3½ inch, Cottage or Dovetail ... " 0·31
No. 7, 4½ " " " ... " 0·33
No. 8, 5½ " " " ... " 0·48
Nos. 1, 1½, 3, Packed in Cases ... ℔ ℔, $0·14
Nos. 6, 7, 8, " " ... " 0·15
Nos. 1, 1½, 3, " Barrels ... " 0·12½
Nos. 6, 7, 8, " " ... " 0·14

Plate Casters. [p. 111

All Iron, Copper Bronzed.

Per set	$0·10	0·11	0·12	0·15	0·17	0·20	0·28
Nos	1	2	3	4	5	6	7

Porcelain Wheel, Copper Bronzed.

Per set	$0·14	0·15	0·18	0·22	0·26	0·30	0·35
Nos	1	2	3	4	5	6	7

Brass Wheel, Copper Bronzed.

Per set	$0·20	0·23	0·28	0·36	0.45	0·57	0·75
Nos	1	2	3	4	5	6	7

Piano-Forte Casters.

Turned Wheels.			Brass Wheels.		
No. 1, Iron	℔ set,	$0·60	No. 1, Iron	℔ set,	$1·25
No. 2, "		0·70	No. 2, "		1·50

Bed Casters. [p. 112

All Iron, Copper Bronzed.

Per set	$0·10½	0·12	0·13	0·16	0·18	0·20	0·40
Inch	1⅜	1⅜	1⅝	2	2	2	2½
Nos	0	1	2	1	2	Heavy.	Heavy.

Appletree Wood Wheels, Copper Bronzed.

Per set	$0·15	0·16	0·18	0·20	0·22	0·40
Inch	1⅝	1⅝	2	2	2	2½
Nos	1	2	1	2	Heavy.	Heavy.

Porcelain Wheels, Copper Bronzed.

Per set	$0·19	0·22	0·25	0·28	0·35	0·70
Inch	1⅝	1⅝	2	2	2	2½
Nos	1	2	1	2	Heavy.	Heavy.

Brass Wheels, Copper Bronzed.

Per set	$0·46	0·54	0·66
Inch	1⅝	2	2
Nos	2	1	2

Globe Wheel Bed Casters. [p. 113

Appletree Wood Wheels, Copper Bronzed.
Appletree Wood Wheels, 1⅝ inch ... ℔ set, $0·22
Appletree " " 2 " ... " 0·35
Porcelain Wheels, Copper Bronzed.
Porcelain Wheels, 1⅝ inch ... ℔ set, $0·33
Porcelain " 2 " ... " 0·45
Lignum-Vitæ Wheels, Copper Bronzed.
Lignum-Vitæ Wheels, 1⅝ inch ... ℔ set, $0·33
Lignum-Vitæ " 2 " ... " 0·45

Straight Bracket Bed Casters. [p. 114

3 inch, All Iron, Copper Bronzed ... ℔ set, $0·90
4 " " " " ... " 1·50
3 " Appletree Wood Wheels, Copper B'zed " 0·80
4 " " " " " 1·50
3 " Lignum-Vitæ Wheels, Copper Bronzed " 0·90
5 " " " " " 1·70

Round Shallow Socket Casters.

All Brass.

Per set	$0·42	0·53	0·64	0·75	0·85	1·05
Diameter of Socket	⅞	1	1⅛	1¼	1⅜	1½ inch.

Brass, with Porcelain Wheels.

Per set	$0·33	0·38	0·50	0·60	0·70	0·80
Diameter of Socket	⅞	1	1⅛	1¼	1⅜	1½ inch.

Round Deep Socket Casters. [p. 115

No. 7, Copper Bronzed Socket and Horn, Brass Wheels.

Per set	$0·37	0·44	0·48	0·60	0·80
Diameter of Socket	1	1⅛	1¼	1⅜	1½ inch.

No. 10, Brass Socket, Copper Bronzed Horn, Brass Wheels.

Per set	$0·45	0·55	0·60	0·70	0·90	1·10
Diameter of Socket	⅞	1	1⅛	1¼	1⅜	1½ inch.

No. 15, Brass Socket, Bronzed Horn, Brass Wheels.

Per set	$0·50	0·60	0·70	0·80	1·00	1·20
Diameter of Socket	⅞	1	1⅛	1¼	1⅜	1½ inch.

No. 21, Brass Socket, Brass Horn, Brass Wheels.

Per set	$0·55	0·65	0·75	0·90	1·10	1·35
Diameter of Socket	⅞	1	1⅛	1¼	1⅜	1½ inch

Japanned Stationary Truck or Box Casters. [p. 116

Per dozen	$3·00	4·20	4·88
Inch	3	4	5

Japanned Swivel Truck or Box Casters.

Per dozen	$2·70	4·50	6·00
Inch	3	4	5

Steel Bar Steelyards. [p. 117

Per dozen	$10·00	12·75	17·25	19·50	21·00	24·50
Pounds	50	100	150	200	250	300

Common, 50 ℔ ... ℔ dozen, $8·87

Hart Pattern Steelyards.

Per dozen	$14·50	17·75	21·00	26·50	31·00	35·50
Pounds	50	100	150	200	250	300

Farmers' Steelyards. [p. 118

To weigh 50 ℔s ... ℔ dozen, $17·75
To weigh 100 " ... " 24·50
To weigh 150 " ... " 37·75
To weigh 200 " ... " 44·00
To weigh 250 " ... " 55·50
To weigh 300 " ... " 62·00
To weigh 400 " ... " 82·00
To weigh 500 " ... " 97·50

Improved English Pattern Steelyards—Full Polished.

To weigh 50 ℔s ... ℔ dozen, $22·25
To weigh 100 " ... " 28·75
To weigh 150 " ... " 40·00
To weigh 200 " ... " 49·00
To weigh 250 " ... " 62·00
To weigh 300 " ... " 69·00
To weigh 400 " ... " 89·00
To weigh 500 " ... " 104·00
[p. 119

Collins' Pattern Steelyards—Full Polished, Heavy.

To weigh 50 ℔s ... ℔ dozen, $16·00
To weigh 100 " ... " 19·50
To weigh 150 " ... " 22·25
To weigh 200 " ... " 33·25
To weigh 250 " ... " 40·00
To weigh 300 " ... " 44·50

Grindstone Fixtures.

With Patent Babbit Metal Boxes.
No. 1, Shafts 15 inches long ... ℔ dozen, $11·50
No. 2, " 17 " ... " 13·25
No. 3, " 19 " ... " 16·50
With Flanges and Patent Babbit Metal Boxes. [p. 120
No. 4, Shafts 15 inches long ... ℔ dozen, $16·50
No. 5, " 17 " ... " 20·00
No. 6, " 19 " ... " 22·25
No. 7, " 21 " ... " 24·50
No. 8, " 24 " ... " 26·50
With Flange and Arbor.
No. 9, Shafts 16½ inches long ... ℔ dozen, $25·50
No. 10, " 19 " ... " 30·00
No. 11, " 21 " ... " 32·00

Japanned Well Wheels. [p. 121

Per dozen	$10·00	13·00	16·50	22·50
Inch	8	10	12	14

Chain Pump Fixtures.

16 Arm, Ohio Pattern, Self-Fast'g Shaft. ℔ doz. sets, $15·00
Well Spouts, Painted, Square Hole ... ℔ dozen, 8·50
Iron Rolls for Bottom of Wells ... " 1·65
Wood Rolls for Bottom of Wells ... " 1·10

Brass Ox Balls. [p. 122

Heavy, Octagon Solid.

Per gross	$10·50	12·00	14·00	18·00	26·00	12·75
Nos	1	2	3	4	5	12

Octagon Solid.

Per gross	$9·00	10·00	11·00
Nos	21	22	23

Tall Pattern Ox Balls.

No. 15, Heavy, Octagon, Length 1¾ inch ... ℔ gross, $20·00
No. 18, Plain, Extra Large, " 2½ " ... " 36·00
No. 19, Octagon Solid " 2 " ... " 38·00

Shelf Brackets. [p. 123

No. 15, Japanned.

Per pair	$0·14	0·27	0·35	0·46	0·60	0·68	1·10	1·30	1·50
Inch	3x4	5x6	6x8	8x10	8x12	10x12	12x14	12x17	12x20

No. 40, Japanned.

Per pair	$0·33	0·55	0·88	1·37	1·80
Inch	4x6	6x8	8x10	9x12	12x15

No. 50, Black and Gold Bronzed.

Per pair	$0.55	0·75	1·37	1·80	2·00
Inch	4x6	6x8	8x10	9x12	12x15

No. 60, Figured Enameled, Packed with Screws.

Per pair	$0·65	0·88	1·50	2·00	2·50
Inch	4x6	6x8	8x10	9x12	12x15

Nos. 20 or 30, Figured Enameled, Packed with Screws.

Per pair	$0·65	0·88	1·50	2·00
Inch	4x6	6x8	8x10	9x12

Connell's Patent Crank Door Bells. [p. 125

Bronzed Steel.
No. 1, 3½ inch, S'ver Plated Crank Handle. ℔ dozen, $26·00
No. 2, 5 " " " " " 31·50
Polished Brass.
No. 10, 3½ inch, Silver Plated Crank Handle. ℔ doz. $34·50
No. 20, 5 " " " " " 47·50
Silver Plated.
No. 30, 3½ inch, Silver Plated Crank Handle. ℔ doz. $42·50
No. 40, 5 " " " " " 57·50
Bronzed Bell Metal.
No. 110, 3½ inch, Engraved, Bronzed Crank Handle ... ℔ doz. $38·50
No. 120, 5 inch, Engraved, Bronzed Crank Handle ... " 51·50
Silver Plated.
No. 130, 3½ inch, Engraved, Silver Plated Crank Handle ... ℔ doz. $48·00
No. 140, 5 inch, Engraved, Silver Plated Crank Handle ... " 62·00

Connell's Patent Pull Door Bells. [p. 126

Bronzed Steel.
No. 50, 3½ inch ... ℔ dozen, $27·00
No. 60, 5 " ... " 33·50
Polished Brass.
No. 70, 3½ inch ... ℔ dozen, $33·50
No. 80, 5 " ... " 43·50
Silver Plated.
No. 90, 3½ inch ... ℔ dozen, $40·00
No. 100, 5 " ... " 50·00
No. 190, 3½ " Engraved, same Pattern as No. 130 ... " 45·00
No. 200, 5 inch, Engraved, same Pattern as No. 140 ... " 55·00

House Bells on Carriages. [p. 127

Complete.
No. 18, with No. 2 Polished Bells, complete .. ℔ doz. $13·00
No. 19, " No. 3 " " ... " 14·00
No. 20, " No. 4 " " ... " 16·50
No. 21, " No. 5 " " ... " 20·00
With Spikes only.
No. 23, with No. 2 Pol'd Bells, and Spikes only. ℔ doz. $8·50
No. 24, " No. 3 " " ... " 9·00
No. 25, " No. 4 " " ... " 11·50
No. 26, " No. 5 " " ... " 15·00

Mortise Bell Cranks.

No. 5, Brass Mortise Cranks, Extra Heavy. ℔ gross, $42·00
No. 6, " " Medium ... " 32·00
No. 7, Iron " ... " 9·50

Side and End Bell Cranks. [p. 128

No. 8, Brass Side Cranks ... ℔ gross, $10·00
No. 9, " End Cranks ... " 9·50
No. 10, Iron Side Cranks ... " 6·50
No. 11, " End Cranks ... " 7·00

Check Springs.

No. 12, Coppered, Extra Large ... ℔ gross, $9·00
No. 13, " " ... " 7·50

Bell Spikes.

No. 14, Iron Bell Spikes ... ℔ gross, $5·00

Cork Pressers.

No. 1, Japanned ... ℔ dozen, $6·00
No. 2, " ... " 4·75
No. 1, Bronzed ... " 7·00
No. 2, " ... " 6·00

Towel Rollers.

Towel Rollers ... ℔ dozen, $3·00

Iron Fire Dogs. [p. 129

Ring Top.
No. 1, 11 inches high, Japanned ... ℔ pair, $1·20
No. 2, 13 " " " ... " 1·85
No. 3, 16 " " " ... " 2·85
No. 21, 11 " " Bronzed ... " 1·40
No. 22, 13 " " " ... " 2·20
No. 23, 16 " " " ... " 3·30
Brass Top.
No. 31, 11 inches high, Japanned ... " 1·75
No. 32, 13 " " " ... " 2·40
No. 33, 16 " " " ... " 3·50
No. 41, 11 " " Bronzed ... " 2·00
No. 42, 13 " " " ... " 2·75
No. 43, 16 " " " ... " 4·00
Ring Top, Heavy. [p. 130
No. 4, 13 inches high, Japanned ... ℔ pair, $2·25
No. 5, 15 " " " ... " 3·00
Steeple Top, Heavy.
No. 6, 16 inches high, Japanned ... ℔ pair, $3·00
No. 7, 18 " " " ... " 3·75
Brass Top, Heavy. [p. 131
No. 10, 15 inches high, Japanned ... ℔ pair, $3·00
No. 11, 18 " " " ... " 3·75
Figured Enameled.
No. 12, 16 inches high, Figured Enameled ... ℔ pair, $4·50

Brass Andirons. [p. 132

Globe Pattern.

Per pair	$7·50	9·00	10·50	12·50	14·50	17·50	20.00	23·00
Nos	0	1	2	3	4	5	6	7
Inch. high	15	16	17	18	19	20	21	22

Globe Pattern, with Back Heads.

Per pair	$8·00	9·50	11·00	13·00	15·00	18·00	20·50	23·50
Nos	0	1	2	3	4	5	6	7
Inches high	15	16	17	18	18½	19	19½	20

Steeple Globe Pattern.

Per pair	$8·00	9·50	11·00	13·00	15·00	18·00	20·50	23·50
Nos	0	1	2	3	4	5	6	7
Inches high	15	15½	16½	17½	18½	19½	20½	21½

Cut Globe Pattern.

Per pair	$25·00	29·00	32·00
Nos	5	6	7
Inches high	20	21½	23

Urn Pattern. [p. 133

Per pair	$7·50	9·00	10·50	12·50	14·50	17·50	20·00	23·00
Nos	0	1	2	3	4	5	6	7
Inches high	15	16	17	18	19	20	21	22

Boston Pattern.

Per pair	$10·50	13·00	16·00
Nos	1	2	3
Inches high	13½	15	16½

Philadelphia Pattern.						
Per pair	$11·00	12·50	15·00	18·00	21·00	23·00
Nos	1	2	3	4	5	6
Inches high	15	16	17	18½	19½	20½

Harp Pattern.				
Per pair	$18·00	21·00	23·00	26·00
Nos	4	5	6	7
Inches high	18	19	20	21

Grecian Base, with Fender. [p. 134

Per pair	$21·00	24·00	27·00
Nos	5	6	7
Inches high	18	19	20

Corinthian, with Fender.					
Per pair	$28·00	32·00	36·00	40·00	44·00
Nos	4	5	6	7	8
Inches high	19	20	21	22	23

Egyptian, with Fender.					
Per pair	$29·00	33·00	37·00	42·00	46·00
Nos	4	5	6	7	8
Inches high	19	20	21	22	23½

Persian, with Fender.				
Per pair	$46·00	50·00	54·00	58·00
Nos	7	8	9	10
Inches high	19	20	21	22

Persian Circular, with Fender. [p. 135
No. 7, 19 inches high ⅌ pair, $52·00
No. 8, 20 " " 56·00
No. 9, 21 " " 60·00
No. 10, 22 " " 64·00

Corinthian Circular, with Fender.
No. 4, 19 inches high ⅌ pair, $34·00
No. 5, 20 " " 38·00
No. 6, 21 " " 42·00
No. 7, 22 " " 46·00
No. 8, 23 " " 50·00

Brass Fenders for Andirons.
No. 1, Brass Fenders, for Andirons Nos. 4, 5 & 6 each, $6·50
No. 2, " 7, 8, 9 & 10 " 7·50

Shovel and Tongs Stands. [p. 136
No. 1, 22 inches high, Malleable Hook, Green and Gold Bronzed each, $1·55
No. 2, 30 inches high, Cast Hook " 2·00
No. 3, 27 " Brass " Porcelain Knob Top " 3·50
[p. 137
No. 4, 27 inches high, Malleable Hook, Green and Gold Bronzed each, $3·00
No. 5, 27 inches high, Malleable Hook, Green and Gold Bronzed " 2·12
No. 6, 26 inches wide, Figured Enameled " 3·50

Blower Stands. [p. 138
No. 1, 10 in. high, Black and Gold Bronzed ⅌ doz. $12·50
No. 10, 10 " Figured Enameled " 20·00

[p. 139
Japanned Iron Head Shovels, Tongs and Pokers.
No. 7, 20 inches long ⅌ dozen pairs, $7·50
No. 8, 22 " " 8·50
No. 9, 26 " " 9·50

Shovels, only.
No. 7, 20 inches long ⅌ dozen, $2·50
No. 8, 22 " " 3·00
No. 9, 26 " " 3·50

Pokers, Bent.
No. 7, 20 inches long ⅌ dozen, $1·75
No. 8, 22 " " 2·00
No. 9 26 " " 2·25

Iron Head Shovels and Tongs. [p. 140
Iron Head Shovels and Tongs.
No. 1, 17 inches long ⅌ dozen pairs, $6·65
No. 2, 19 " " 8·87
No. 3, 20 " " 11·12
No. 4, 22 " " 13·30
No. 5, 25 " " 15·50
No. 6, 26 " " 17·75

Iron Head Shovels, only. [p. 141
No. 1, 17 inches long ⅌ dozen, $3·30
No. 2, 19 " " 4·40
No. 3, 20 " " 5·50
No. 4, 22 " " 6·60
No. 5, 25 " " 7·75
No. 6, 26 " " 8·87

Iron Head Tongs, only.
No. 1, 15 inches long ⅌ dozen, $4·40
No. 2, 17 " " 5·90
No. 3, 19 " " 7·38
No. 4, 21 " " 8·87
No. 5, 24 " " 10·37
No. 6, 25 " " 11·75

Heavy Iron Kitchen Shovels and Tongs.
No. 1, 30 inches long ⅌ dozen pairs, $25·00
No. 2, 32 " " 27·75

Heavy Iron Kitchen Shovels, only.
No. 1, 30 inches long ⅌ dozen, $12·50
No. 2, 32 " " 13·87

Heavy Iron Kitchen Tongs, only.
No. 1, 26 inches long ⅌ dozen, $16·63
No. 2, 28 " " 18·50

Brass Head Shovels and Tongs. [p. 142
Brass Head Shovels and Tongs.
No. 1, 19 inches long ⅌ pair, $2·12
No. 2, 22 " " 2·37
No. 3, 25 " " 2·80
No. 4, 29 " " 3·30
No. 5, 31 " " 4·00
No. 6, 34 " " 4·75

Brass Head Shovels, only. [p. 143
No. 1, 19 inches long each, $1·05
No. 2, 22 " " 1·16
No. 3, 25 " " 1·40
No. 4, 29 " " 1·65
No. 5, 31 " " 2·00
No. 6, 34 " " 2·37

Brass Head Tongs, only.
No. 1, 18 inches long ⅌ dozen, $16·87
No. 2, 21 " " 19·00
No. 3, 24 " " 22·63
No. 4, 28 " " 26·63
No. 5, 30 " " 31·75
No. 6, 33 " " 36·00

Urn Head, Arch Joint—Common Pattern.
No. 1, 24 inches long ⅌ pair, $4·25
No. 2, 26 " " 4·75
No. 3, 28 " " 5·25
No. 4, 30 " " 6·30

[p. 144
Brass Head Shovels, Tongs and Pokers—Heavy Pattern.
Shovels and Tongs, Polished Pans.
No. 6, 31 inches long ⅌ pair, $6·50
No. 7, 33 " " 7·50
No. 8, 36 " " 8·50

Shovels, Tongs and Pokers, Polished Pans.
No. 6, 31 inches long ⅌ set, $8·00
No. 7, 33 " " 9·00
No. 8, 36 " " 10·00

Shovels and Tongs, Polished Pans.
No. 9, Cut Head, Grecian, to match Andirons. ⅌ p'r. $12·00
No. 10, " Corinthian, " " 15·00

Iron Head Pokers, Bent or Straight. [p. 145
No. 0, 13 inches long ⅌ dozen, $1·00
1, 14 " " 1·25
2, 15 " " 1·75
3, 16 " " 2·25
4, 18 " " 2·75
5, 20 " " 3·25
6, 23 " " 3·75

Iron Head Pokers, Heavy Square Point, Straight.
No. 1, 18 inches long ⅌ dozen, $2·00
2, 19 " " 2·50
3, 21 " " 3·00
4, 25 " " 3·50
5, 27 " " 4·00
6, 28 " " 4·50

Brass Head Pokers, Bent or Straight.
No. 0, 16 inches long ⅌ dozen, $3·50
1, 19 " " 4·50
2, 21 " " 6·00
3, 25 " " 8·00
4, 27 " " 10·00
5, 30 " " 12·00
6, 32 " " 14·00

Brass Head Pokers, Heavy Square Point, Straight.
No. 1, 19 inches long ⅌ dozen, $5·00
2, 21 " " 6·75
3, 26 " " 9·00
4, 29 " " 11·00
5, 31 " " 13·25
6, 34 " " 15·50

Cast Iron Coal Shovels. [p. 146
No. 1, 14 inches long ⅌ dozen, $2·00

Wrought Iron Coal Shovels.
Wrought Iron Handles.
No. 00, 14 inches long ⅌ dozen, $2·00
0, 15 " " 2·25
4, 15 " " 2·50
5, 18 " " 3·00
8, 26 " " 4·50

Wood Handles.
No. 1, 14 inches long ⅌ dozen, $2·25
2, 15 " " 2·50
3, 16 " " 3·00
6, 19 " " 3·50
7, 21 " " 4·00

Spiral Spring Coal Tongs. [p. 147
No. 1, 16 in. long, Japanned, opens 7 inches ⅌ doz. $8·50
2, 16 " Bronzed " 7 " " " 9·50

New Pattern Coal Tongs.
No. 3, 19 in. long, Japanned, opens 7 inches ⅌ doz. $7·50

Duck Pattern Toy Sad Irons.

Per dozen	$0·90	1·00	1·10	1·20	1·75	2·25
Nos	27	28	29	30	31	32
Inches long	1½	2	2¼	2½	2½	3

Toy Sad Irons, with Stands.						
Per dozen	$1·20	1·30	1·40	1·50	2·00	2·50
Nos	27	28	29	30	31	32
Inches long	2½	3	3½	4	4½	5

Sad Iron Stands. [p. 148
No. 33, 8 inches long ⅌ dozen, $1·20
37, 10 " " 1·60

Coffee Pot Stands.
No. 34, 5 inches diameter, Japanned ⅌ dozen, $1·50
35, 5 " " " 1·50
36, 5 " " " 1·50
34, 5 " Bronzed " 2·00
35, 5 " " " 2·00
36, 5 " " " 2·00

Stove Cover Lifters, with Wood Handles. [p. 149
No. 1, 10 inches long, Japanned, Riveted ⅌ gross, $9·00
3, 11 inch, Japanned, Pol'd Iron Ferrules " 9·75

Paste Jaggers.
No. 200, Brass, Polished and Lacquered ⅌ gross, $24·00
800, " Silver Plated " 26·00

Family Grindstones. [p. 150

Per dozen	$16·00	19·00	22·00	26·00	30·00	36·00	42·00
Inch	6	7	8	9	10	11	12

Improved Pattern Butchers' Cleavers.

Per dozen	$25·25	29·75	34·25	38·75	43·25	48·50	54·00
Nos	0	1	2	3	4	5	6
Inches of Cut	7	8	9	10	11	12	13

Nut Cracks.
Japanned ⅌ dozen, $6·50

Figured Enameled Match Safes. [p. 151
No. 10, Packed with Screws ⅌ dozen, $4·50

Enameled Twine Boxes.
No. 1, Enameled ⅌ dozen, $5·50
2, " Packed with Screws " 6·50

Boot Jacks. [p. 152
No. 2, Japanned ⅌ dozen, $4·50
102, Bronzed " 5·50
3, Japanned " 2·50
103, Bronzed " 3·25
4, Japanned " 5·50
104, Bronzed " 6·50
5, Japanned " 4·50
106, Figured Enameled " 5·50

Silver Plated Carriage Bands.

Inch or under, ⅌ set,	3	3⅛	3¼	3⅜	3½	3⅝	3¾	3⅞	4	4⅛	4¼	4⅜	4½
Rim 1¼ inch deep	$0·85	0·92	0·99	1·06	1·13	1·20	1·27	1·34	1·41	1·48	1·55	1·62	1·69
Rim, Heavy, 1¼ inch deep	0·95	1·05	1·15	1·25	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05	2·15
Rim, Extra Heavy, 1¼ inch deep	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45	2·55
Cincinnati Rim, 1¼ inch deep	1·40	1·50	1·60	1·70	1·80	1·90	2·00	2·10	2·20	2·30	2·40	2·50	2·60
Cincinnati " 2 "	1·75	1·95	2·15	2·35	2·55	2·75	2·95	3·15	3·35	3·55	3·75	3·95	4·15
Cincinnati " 2¼ "	2·50	2·70	2·90	3·10	3·30	3·50	3·70	3·90	4·10	4·30	4·50	4·70	4·90
Cincinnati " 2½ "	3·00	3·20	3·40	3·60	3·80	4·00	4·20	4·40	4·60	4·80	5·00	5·20	5·40
Bell, Silver inside, 1¼ inch deep	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45	2·55
Bell, " all over, 1¼	1·50	1·60	1·70	1·80	1·90	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70
Bell Central Park, Silver inside, 1¼ inch deep	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45	2·55	2·65	2·75	2·85	2·95
Bell " " all over, 1¼	1·90	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70	2·80	2·90	3·00	3·10
Central Park, Silver inside, 1¼ inch deep	1·50	1·60	1·70	1·80	1·90	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70
Central " " all over, 1¼ "	1·65	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45	2·55	2·65	2·75	2·85
Empire Screw Cap, 1¼ inch deep	1·80	1·90	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70	2·80	2·90	3·00
Philadelphia, 1¼ inch deep	0·85	0·92	0·99	1·06	1·13	1·20	1·27	1·34	1·41	1·48	1·55	1·62	1·69
Philadelphia, Heavy, 1¼ inch deep	0·95	1·05	1·15	1·25	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05	2·15
Philadelphia, Extra Heavy, 1¼ inch deep	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45	2·55
Philadelphia Screw Cap, 1¼ inch deep	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70	2·80	2·90	3·00	3·10	3·20
Boston, 1 inch deep	0·75	0·82	0·89	0·96	1·03	1·10	1·17	1·24	1·31	1·38	1·45	1·52	1·59
Boston, Heavy, 1¼ inch deep	0·85	0·95	1·05	1·15	1·25	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05
Boston, Extra Heavy, 1¼ inch deep	1·25	1·35	1·45	1·55	1·65	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45
Boston Screw Cap, 1¼ inch deep	1·80	1·90	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70	2·80	2·90	3·00
Japanned, Silver Screw Cap	1·35	1·42	1·49	1·56	1·63	1·70	1·77	1·84	1·91	1·98	2·05	2·12	2·19
Close Plated, on Iron, Heavy Rim, 1¼ inch deep	1·50	1·60	1·70	1·80	1·90	2·00	2·10	2·20	2·30	..	..	..	..
Close Plated, " " 1⅜	1·75	1·85	1·95	2·05	2·15	2·25	2·35	2·45	2·55	..	..	..	..
Close Plated, on Composition, Heavy Rim, 1¼ inch deep	2·00	2·10	2·20	2·30	2·40	2·50	2·60	2·70	2·80	..	..	..	..
Close Plated, " " 1⅜	2·25	2·45	2·65	2·85	3·05	3·25	3·45	3·65	3·85	..	..	..	..
Silver Sand (Ives' Patent)	0·40	..	0·45	..	0·50	..	0·55	..	0·60	..	0·65	..	0·70

[pp. 153 to 158

Iron Carriage Bands. [p. 161 [p. 159

Iron Rim Bands, for Painting.

Inch or under.	3	3⅛	3¼	3⅜	3½	3⅝	3¾
1¼ in. deep ⅌ set,	$0·40	0·45	0·50	0·55	0·60	0·65	0·70
1⅜ " "	0·45	0·50	0·55	0·60	0·65	0·70	0·75
2 " "	0·50	0·55	0·60	0·65	0·70	0·75	0·80
1½ " "	0·60	0·65	0·70	0·75	0·80	0·85	0·90

Inch or under.	3⅞	4	4⅛	4¼	4⅜	4½
1¼ in. deep ⅌ set,	$0·75	0·80	..	..	..	..
1⅜ " "	0·80	0·85	0·90	0·95	..	..
2 " "	0·85	0·90	0·95	1·00	1·05	1·10
1½ " "	0·95	1·00	1·05	1·10	1·15	1·20

Iron Bell Bands, for Painting.

Inch or under,	3	3⅛	3¼	3⅜	3½	3⅝	3¾	3⅞	4
1¼ in. deep, ⅌ set,	$0·50	0·55	0·60	0·65	0·70	0·75	0·80	0·85	0·90

Plain Shaft Sockets—No. 5. [p. 160

Silver Plated ⅌ doz. pairs,	$1·65	1·80	1·95	2·10	2·25
Inch	¾	⅞	1	1⅛	1¼

Extra Heavy Straight Shaft Sockets—No. 10.

Gold Plated ⅌ dozen pairs,	$3·80	4·00	4·40
Nickel Plated	3·45	3·60	4·00
Solid Oroide	2·75	3·00	3·25
Silver Plated	2·75	3·00	3·25
Inch	¾	⅞	1

Extra Heavy Octagon Shaft Sockets—No. 15.

Gold Plated ⅌ dozen pairs,	$8·40	9·60
Nickel Plated	7·25	8·60
Solid Oroide	6·60	7·80
Silver Plated	6·60	7·80
Inch	¾	⅞

Ball Shaft Sockets—No. 20.

Silver Plated—per dozen pairs	$2·05	2·20	2·35	2·50	2·65
Inch	¾	⅞	1	1⅛	1¼

Philadelphia Ball Shaft Sockets—No. 25.

Silver Plated—per dozen pairs	$3·00	3·25	3·50
Inch	¾	⅞	1

Acorn Hame or Shaft Sockets—No. 30.

Silver Plated—per dozen pairs	$3·00	3·25	3·50
Inch	¾	⅞	1

Globe Hame Sockets—No. 35.
Silver Plated, ⅞ inch ⅌ dozen pairs, $3·50

[p. 162
Extra Heavy Plain Button End Whiffletree Sockets, No. 40

Silver Plated ⅌ dozen pairs,	$6·00	6·25
Inch	¾	⅞

Extra Heavy Plain Whiffletree Sockets—No. 45.

Gold Plated ⅌ dozen pairs,	$9·00	9·50
Nickel Plated	6·75	7·00
Solid Oroide	6·00	6·25
Silver Plated	6·00	6·25
Inch	¾	⅞

Extra Heavy Octagon Whiffletree Sockets—No. 50.

Gold Plated ⅌ dozen pairs,	$16·20	16·80
Nickel Plated	11·20	11·80
Solid Oroide	10·20	10·80
Silver Plated	10·20	10·80
Inch	¾	⅞

[p. 163
Extra Heavy Plain Cock Eye End Whiffletree Sockets—No. 55.

Gold Plated ⅌ dozen pairs,	$9·00	9·50
Nickel Plated	6·75	7·00
Solid Oroide	6·00	6·25
Silver Plated	6·00	6·25
Inch	¾	⅞

Extra Heavy Octagon Cock Eye End Whiffletree Sockets—No. 60.

Gold Plated ⅌ dozen pairs,	$16·20	16·80
Nickel Plated	11·20	11·80
Solid Oroide	10·20	10·80
Silver Plated	10·20	10·80
Inch	¾	⅞

Acorn Neck Yoke Sockets, with Round Wrought Loops—No. 65.

Silver Plated ⅌ dozen pairs,	$5·25	6·25	7·25
Inch	¾	⅞	1

[p. 164
Central Park Plain Neck Yoke Sockets—No. 70.

Gold Plated ⅌ dozen pairs,	$11·00	11·50	13·00
Nickel Plated	7·75	8·25	10·00
Solid Oroide	7·00	7·50	9·00
Silver Plated	7·00	7·50	9·00
Inch	¾	⅞	1

Central Park Ball Neck Yoke Sockets—No. 75.

Gold Plated ⅌ dozen pairs,	$11·50	12·00	13·50
Nickel Plated	8·25	8·75	10·50
Solid Oroide	7·50	8·00	9·50
Silver Plated	7·50	8·00	9·50
Inch	¾	⅞	1

Extra Heavy Plain Neck Yoke Sockets—No. 80.

Gold Plated ⅌ dozen pairs,	$11·50	12·00
Nickel Plated	8·00	8·50
Solid Oroide	7·25	7·75
Silver Plated	7·25	7·75
Inch	¾	⅞

[p. 165
Extra Heavy Octagon Neck Yoke Sockets—No. 85.

Gold Plated ⅌ dozen pairs,	$18·12	19·50
Nickel Plated	14·50	16·35
Solid Oroide	13·20	14·88
Silver Plated	13·20	14·88
Inch	¾	⅞

Plain Pole Sockets—No. 90.

Silver Plated—per dozen	$2·75	3·25	3·75	4·35
Inch	1⅛	1¼	1⅜	1½

Ball Pole Sockets—No. 95.

Silver Plated—per dozen	$3·50	4·00	4·50	5·00
Inch	1⅛	1¼	1⅜	1½

[p. 166
Extra Heavy Plain Flange Pole Sockets—No. 100.

Gold Plated ⅌ dozen,	$9·25	10·25
Nickel Plated	8·75	9·25
Solid Oroide	8·00	8·50
Silver Plated	8·00	8·50
Inch	1⅛	1¼

Extra Heavy Octagon Flange Pole Sockets—No. 105.

Gold Plated ⅌ dozen,	$18·00	18·00
Nickel Plated	16·50	16·50
Solid Oroide	15·00	15·00
Silver Plated	15·00	15·00
Inch	1⅛	1¼

Carriage Knobs. [p. 167

English Finsh'd, Jap. ⅌ gro	$1·40					
Silver Plated, "	4·00					
Silver Capped, "	$1·44	1·44	1·44			
Japanned, "	0·80	8·80	8·80	0·80	0·80	0·80
Nos	2	3	140	175	185	195

[p. 168
Silver Plated Acorn Head Spring Bar Bolts.
Diameter, ¼ inchx2¼, 2⅜ and 2½ inches long under Head ⅌ doz., $2·50
Diameter, 5-16 inchx2¼, 2⅜ and 2½ inches long under Head " 2·50

Silver Plated Dash Collars.

Per gross	$37·50	37·50	37·50	45·00	56·00	60·00	67·00	75·00
Diam., inch	¼	5-16	⅜	7-16	½	⅝	¾	½
Length, "	1⅛	2	2	2	2	2	2	2

Per gross	$45·00	45·00	52·50
Diameter, inch	5-16	⅜	7-16
Length, inch	3	3	3

Silver Plated Dash Rods.

With 2 inch Collars—⅌ doz	$8·00	8·50	9·00	13·00	17·50
Inch	¼	5-16	⅜	7-16	½

Inside Coach Handles. [p. 169

Silver Plated—⅌ dozen pairs	$6·00	6·00	6·00	6·00	6·00
Nos	2	3	5	6	10

Outside Coach Handles.
Silver Plated—No. 7 ⅌ dozen pairs, $15·50
" " 8 " 15·00
" " 9, same style as No. 8, but larger " 16·50

[p. 170
Silver Plated Round Acorn Top Prop Nuts.
Silver Plated ⅌ gross, $30·00

Silver Plated Acorn Top Prop Nuts.
Silver Plated ⅌ gross, $30·00

Silver Plated Bull's Eye Top Prop Nuts.
Silver Plated ⅌ gross, $20·00

Silver Plated Acorn Top Prop Rivets.
Silver Plated ⅌ gross, $20·00

Silver Plated Bull's Eye Top Prop Rivets.
Silver Plated ⅌ gross, $15·00

Japanned Polished and Tinned Stirrups. [p. 171

Tinned ⅌ doz. pairs,	$5·00	5·00	6·00	5·00	5·00	6·00
Polished "	3·00	3·00	3·75	3·00	3·00	3·75
Japanned "	3·00	3·30	3·75	3·00	3·00	3·75
Nos	30	35	45	65	66	Rp'd

Ladies' Stirrups.

Brass ⅌ dozen,	$4·50	4·50	4·50
Tinned "	2·00	2·00	2·00
Japanned or Polished "	1·25	1·25	1·25
Nos	1	2	3
Same style as Nos	20	65	35

Apron Hooks and Rings.
Japanned ⅌ gross, $2·75
Tinned " 3·25
Silver Plated on Brass " 17·00

PHILADELPHIA.

Messrs. LLOYD, SUPPLEE & WALTON, under date of March 11, 1873, write us as follows: The volume of trade for the last week has been somewhat greater than any week since Jan. 1st, 1873. There appears to be quite a disposition to order certain lines of goods which parties think low, in fair and even large quantities. There has been quite an excitement here in regard to the recent cut upon Door Locks and Knobs, which began by one manufacturer quoting for immediate orders 40 per cent. discount. Of course this could only remain concealed for a few hours before the whole matter was made public, and at once met by one or two other agents, who offer for the present at 40 per cent. discount. This price has induced many parties to place large orders, as there is no guarantee of their remaining at that price. We have heard of a greater discount than 40 per cent. being offered, but on inquiry ascertained that that discount was given from Mallory, Wheeler & Co.'s list. Making the calculation, we find that 40, 10 and 5 per cent. off Mallory, Wheeler & Co.'s list is an advance of 6½ per cent. upon 40 per cent. off what is known as "Combination List." The manufacturers of Edge Tools are now quite busy working upon orders. They complain of difficulty in getting Norway Iron at any price, and what they are to do in the future they cannot imagine. We hear of no further changes outside of those named in this and former letters.

PITTSBURGH.

MARCH 8.—The weather up to yesterday was very cold. The thermometer within the past week was down to one or two degrees below zero, which is something unusual in this section of the country at this season of the year. As might be expected, general trade has been retarded in consequence. Navigation is again suspended, for the fifth or sixth time this winter, and the railroads are more or less crippled. Hence, transportation is very restricted, and business has been, and is still, very much restricted in consequence. Yesterday and the day before, however, were clear and pleasant, giving us a foretaste of spring, and it is hoped that the cold, freezing weather is about over. Taking it all through, this has been one of the severest winters we have had for many years, and trade in all our leading articles of manufacture, including Iron, Nails, Glass and Copper, has been very dull, and what made matters still worse was the stringency in money matters, which rendered it very difficult to make collections. There have been an unusually large number of failures, caused mainly by the money pressure. Some of our most substantial firms have been, and are still, very much cramped, experiencing great trouble in raising funds to meet their obligations; and some of them that ordinarily would have got through without any trouble, have been forced to go under. We are in hopes, however, that the worst is over, that the money market will soon commence to work easier, although at present, the indications are not very encouraging. The iron trade is fair, though not near as brisk as it was at this time last year; however, it is improving slowly, and there is no question but what business will be lively as soon as the fine weather sets in. The market for Finished Irons, although not brisk, is better than it has been; orders are coming in more freely, and as stocks in the West, and those sections of the country that usually draw their supplies from Pittsburgh, are light, it is probable that the mills will have all they can do from now until July. The worst feature in connection with this branch of trade just now, lies in the fact that prices are too low, taking the cost of the raw material as a basis, and an early advance seems almost inevitable, however unpleasant it may be to our manufacturers. The Nail trade continues to improve steadily; buyers seem to realize the situation; they regard Nails a good investment at present prices, hence they are buying pretty freely. On the other hand, manufacturers are not soliciting orders, and some of them are unwilling to book many or any large orders at the card. Nails, like Bar Iron, are too low, there is little or no margin at present prices, and early advance is almost certain. The recent reduction in Finished Irons and Nails was made with a view of stimulating the demand, increasing the consumption, and, at the same time, depreciating the cost of the raw material; the first point, to some extent, has been attained, but the second one, thus far, has not been realized. There is a fair demand for Pig Iron, but the inquiry is mainly for small lots to supply immediate wants, and while there has been no quotable change in prices, as compared with last week, the general tone of the market is toward increased firmness. The mills, as a rule, have fair stocks of Common and Medium Irons, hence the market for these grades is rather quiet; but there is considerabe inquiry for good Red Short Irons for mixture, and as it is in light supply, it is held with increased firmness. Two or three weeks ago holders were asking $43 to $43, and buyers were offering $40. Several lots have been sold recently at the last named figures, and now there are but few sellers under $45. It is said by those who are well informed in regard to the matter, that the margin, even at $45, taking the enhanced cost of the ore into consideration, is small, and some operators predict that good Red Short Irons will not stop much, if any, this side of $50. Gray Forge Irons are in fair request, with sales at $40, 4 mos.; Mottled and White, $37 to $39; No. 1 to No. 1 Extra Foundry Irons, $46 to $48; No. 2, $43 to $45; No. 3, $40 to $41. Upon the whole, while there is an absence of speculation, caused no doubt by the stringency in money matters, the indications generally indicate increased firmness, and it is almost certain that when there is a change in prices it will be upward. The window glass trade, although, like everything else, backward, is improving, and our manufacturers are looking for a large spring and summer trade. There is no change in the card, and 50 and 10 seems to be regarded as the ruling discount for round lots, although it is said that some sales have been made recently at 60 straight. Manufactured Copper continues very dull. There has been very little inquiry since last fall, and no change in prices since last May. Iron is being substituted for Copper in many instances, in consequence of its being so much cheaper; hence the consumption is diminishing. There is a continued good demand for Steel, and the mills are all in full blast. Prices are unchanged, but very firm, with an upward tendency. The inquiry at present is mainly for the finer grades used in the manufacture of tools.

The *Commercial* of 8th inst. says: The market for Pig Iron remains about the same as last week, with an evident tendency toward higher prices for iron of good quality, and especially for red short of the standard brands. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.
800 tons medium gray, close gray and mottled private terms.
800 tons medium gray, close gray and mottled private terms.
500 tons gray forge red short $43 50—4 mos.
500 tons gray forge 40 00—4 mos.
400 tons gray forge 40 00—4 mos.
300 tons extra gray forge 40 50—cash.
300 tons gray forge 40 00—4 mos.
200 tons gray forge red short 43 00—4 mos.
130 tons gray forge neutral 40 00—4 mos.
100 tons gray forge red short 43 50—4 mos.
100 tons neutral 40 00—4 mos.
50 tons silvery 37 00—4 mos.

ANTHRACITE.
200 tons red short mottled $39 00—4 mos.
200 tons white and mottled red short 39 00—4 mos.
130 tons No. 2 foundry 45 00—4 mos.
100 tons No. 3 mill 39 00—4 mos.
100 tons No. 3 cold short 39 00—4 mos.
100 tons white red short 39 00—4 mos.
100 tons No. 3 cold short 39 00—4 mos.
50 tons No. 1 foundry 45 00—4 mos.
50 tons No. 1 foundry 45 00—4 mos.
40 tons No. 3 foundry 42 00—4 mos.
30 tons B No. 1 foundry 45 00—4 mos.
20 tons No. 1 foundry 46 00—4 mos.
20 tons extra No. 2 foundry 45 00—4 mos.
10 tons extra No. 2 foundry 44 00—cash.
10 tons No. 1 foundry 47 00—4 mos.
150 tons Chickies forge at furnace 40 00—cash.

HANGING ROCK CHARCOAL.
115 tons No. 2 foundry $55 00—4 mos.
90 tons No. 1 foundry $55, 56 @ 57 00—4 mos.
90 tons mill $46 00 @ 48 00—4 mos.
60 tons No. 1 foundry 58 00—4 mos.
45 tons cold blast 68 00—4 mos.
30 tons charcoal foundry 55 00—4 mos.
15 tons Olive, No. 1 58 00—4 mos.

MISSOURI CHARCOAL.
20 tons No. 1 foundry $60 00—4 mos.

ALLEGHENY COKE.
100 tons coke private terms.

BLOOMS.
10 tons charcoal slabs $95 00—5 mos.

CONNELLSVILLE COKE.
200 tons Dunbar, No. 1 forge $40 00—4 mos.

BOSTON.

MARCH 8.—The market for both Pig and Bar Iron is very firm, and prices tend upward. Reports from abroad indicate a constant hardening in the market for Refined Bar. Prices have now reached a point which prevents any American importations, and dealers are compelled to replenish their stocks from American mills. These are firm in their prices, and some of them refuse to take orders at a fixed rate, on account of the high cost of Scrap and Pig Iron. Others are filling orders at about 4½ cents, the ruling Philadelphia price. Some New England mills are selling at the same price. Scotch Pig is very firm, and, owing to the smallness of the stock here, and the advices from abroad, prices are higher. We hear of a dealer who paid $68 for a lot of Coltness for a customer, but some houses quote lower prices. Some holders of American are asking higher prices than last week, but lots can be bought at our lowest quotations. We quote yard lots of American Pig Iron at $55 @ $58 per ton, including No. 2 extra at $53 @ $54, and No. 1 at $56 @ 58. Scotch is held firmly. We quote Eglinton at $60, Coltness at $64 @ $70, Gartsherrie at $61 @ $62. Charcoal at $57 @ $60. American and English Bar are selling fairly at $105 @ $117·50 per ton for the ordinary sizes, and $125 @ $150 for extra sizes, according to size.—*Commercial Bulletin.*

CINCINNATI.

Messrs. ADDY, HULL & Co., under date of March 10, write us as follows: Iron is arriving more freely by river and rail. Market more active for No. 1 Foundry, and for Forge Irons. No. 2 grades are dull and neglected.

HOT BLAST CHARCOAL.
Hanging Rock No. 1 ⅌ ton $55·00 @ 56·00—4 mos.
" " No. 2 53·00 @ 54·00—4 mos.
" " Forge 45·00 @ 46·00—4 mos.
Tennessee No. 1 54·00 @ 55·00—4 mos.
" Forge 44·00 @ 45·00—4 mos.
Alabama No. 1 55·00 @ 57·00—4 mos.
Missouri No. 1 55·00 @ 57·00—4 mos.
" No. 2 53·00 @ 54·00—4 mos.

HOT BLAST STONE COAL.
Missouri No. 1 ⅌ ton $55·00 @ 56·00—4 mos.
" Forge 43·00 @ 44·00—4 mos.
Ohio No. 1 53·00 @ 55·00—4 mos.
" Forge 40·00 @ 43·00—4 mos.
Scotch Pig, No. 1 56·00 @ 57·00—4 mos.

COLD BLAST CHARCOAL.
Hanging Rock Car Wheel ⅌ tn. $60·00 @ 65·00—4 mos.
Missouri " " 60·00 @ 63·00—4 mos.
Kentucky " " 58·00 @ 60·00—4 mos.
Tennessee " " 58·00 @ 60·00—4 mos.
Georgia " " 60·00 @ 63·00—4 mos.
Alabama " " 60·00 @ 63·00—4 mos.
Machinery and Forge 58·00 @ 60·00—4 mos.
Blooms 112·00 @ 116·00—4 mos.

LOUISVILLE.

Mr. GEO. H. HULL, under date of March 10, writes us as follows: The market continues firm without quotable change. The mills have bought largely during last four weeks, and there is less inquiry for Forge Irons. Foundry metal is more in request and is held at full figures. The stock of Cold Blast Iron is light, and prices are firm. The usual time, four months, is allowed on quotations below:

HOT BLAST CHARCOAL.
No. 1 F'dry, from Hanging Rock Ores $55·00 @ 56·00
" 2 " " " " 53·00 @ 54·00
" 1 Forge, " " " 45·00 @ 47·00
" 1 F'dry, from Tennessee Ores 54·00 @ 55·00
" 2 " " " 52·00 @ 53·00
" 1 Forge, " " 45·00 @ 47·00
" 1 F'dry, from Alabama Ores 56·00 @ 57·00
1 " " Iron Mountain Ores 58·00 @ 60·00

HOT BLAST STONE COAL.
No. 1 F'dry, from Missouri Ores 54·00 @ 55·00
2 " " " 52·00 @ 53·00
" 1 Forge, " " 44·00 @ 45·00

COLD BLAST CHARCOAL.
Car Wheel from Hanging Rock Ores 60·00 @ 65·00
" " Tennessee Ores 56·00 @ 58·00
" " Alabama Ores 60·00 @ 62·00
" " Georgia Ores 60·00 @ 62·00
" " Missouri Ores 58·00 @ 60·00
" " Kentucky 58·00 @ 60·00

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, corner of South Charles and Lombard streets, report us the following prices, under date of March 11, 1873: We have all again had an exceedingly quiet week, with but few inquirers, and these confined to small purchases, and for limited amounts. Prices still continue without profit to the dealers; in fact the same, or less, than the material would cost delivered here. Present quotations are shaded to desirable customers.

AMERICAN REFINED BAR IRON.
1 to 6 wide by ⅜ to 1 thick } 4⅛c. to 4⅜c. per lb.
1 to 4½ wide by 1⅛ to 2 thick }
Round and square, ordinary sizes, from ⅜ to 2 inclusive 4⅛c. to 4⅜c. "
Hoop Iron, 1⅛ wide and upward 5⅜ to 6 c. per lb.
Band Iron, from 1⅛ to 4 in. wide 5 to 5⅜c. "
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ⅝ thick 5⅛ to 5⅜c. "
Norway Nail Rods 7⅜c. to 8c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes 17c. "
Machinery Steel 13c. "
Cast Spring Steel 11c. "
Homogeneous Steel Plate 13c. "
Perkins' Horse Shoes, per keg of 100 lbs. $6·25
" Mule Shoes " " 7·25
Common Horse Nails, from 14c. to 18c per pound.

	10	9	8	6	
Putnam Horse Nails	23	24	25	26	28c. per lb.

R. R. Spikes 5⅜ by 9-16 at 5⅛c per lb.

CLEVELAND.

Messrs. REDDINGTON & ADAMS, under date of March 10, write us as follows: The Pig Iron market here continues firm, with an upward tendency. There are numerous inquiries for Nos. 1 and 2 Lake Superior Charcoal for spring delivery. We make no change in last week's quotations, which are as follows:

LAKE SUPERIOR CHARCOAL IRON FOR MALLEABLE AND CAR WHEEL USE.
No. 1, on cars here $60·50—4 m.
No. 2, " 60·50—4 m.
No. 3, " 60·50—4 m.
No. 4, " 64·50—4 m.
No. 5, " 65·50—4 m.

BITUMINOUS IRONS FROM LAKE SUPERIOR ORE.
Prime No. 1 Foundry $51·50
" No. 2 " 52·50
" No. 1 Forge $43·50 @ 45·00

AMERICAN BLACK-BAND IRON, SMELTED WITH BITUMINOUS COAL.
No. 1, on cars here $55·50—4 m.
No. B-1, " 53·50—4 m.
No. 2, " 52·50—4 m.

H. B. HANGING ROCK CHARCOAL.
No. 1, on cars here $60·50—4 m.
No. 2, " 58·50—4 m.

C. B. TENNESSEE CHARCOAL.
No. 1, on cars here $60·50—4 m.

C. B. RED RIVER (Kentucky).
No. 3, on cars here $62·50—4 m.
No. 4, " 64·50—4 m.
No. 5 " —4 m.

H. B. MISSOURI CHARCOAL.
No. 1, on cars here $62·50—4 m.
No. 2, " 61·50—4 m.

SCOTCH AND ENGLISH IRONS.
Glengarnock, on cars here $60·50—4 m.
Eglinton, " 60·50—4 m.
Ayresome, " 58·50—4 m.
Lanthrope, " 58·50—4 m.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending March 11, 1873:

Hardware.

Boker Hermann & Co.
Files, cks., 13
Per. caps, cases, 5
Guns, cases, 3
Cases, 2
Arms, cases, 14
Casks, 11
Bodenheim, Meyer & Co.
Mdse. pkgs., 2
Arms, cases, 7
Clark, Wilson & Co.
Casks, 2
Coffin, Lee & Co.
Casks, 12
Dickinson Henry
Casks, 6
Degraw, Aymar & Co.
Chains, 2; cks., 8
Folsom H. & D.
Per. caps, cases, 5
Field A. & Co.
Mdse. pkgs., 36
Chains, cks., 104
Fuller Bros.
Mdse. pkgs., 1
Grubb J. C.
Arms, cases, 4
Hildick A. H.
Casks, 4
Anvils, 15
Haughwout E. V. & Co.
Mdse. pkgs., 18
Harmar, Hayes & Co
Saddlery, cases, 2
King H. & J. W.
Chains, casks, 3
Casks, 3
Lau & Garlichs,
Per. caps, cases, 2
Arms, cases, 13
Lang W. Bailey & Co.
Cases, 1
Merchants Dispatch Co.
Casks, 3
Milliken S. Jr.,
Wire, bds., 855
Moss F. W.
Files, cks., 7
Mulford & Sprague,
Casks, 2
Cases, 1
Moore's J. P. Sons,
Arms, cases, 14
Noyes, White & Co.
Cases, 1
Phelps, Bloom & Brown,
Cases, 3
Rosenthal J. & Co.
Casks, 2
Remington E. & Son,
Per. caps, cases, 1
Russell & Erwin Mfg. Co.
Files, cks., 4
Schoverling & Daly,
Mdse. pkgs., 1
Schuyler, Hartley & Graham,
Arms, cases, 8
Struller Louis,
Arms, cases, 6
Schweitzer Mfg. Co.
Mdse. pkgs., 2
Sawyer John,
Wire rope, coils, 1
Casks, 1
Turnor R. A.
Mdse. pkgs., 6
Van Wart & McCoy
Chains, cks., 5
Cases, 10
Casks, 2
Mdse. pkgs., 1
Van Nest A. R. & Co.
Casks, 2
Cases, 8
Witte John G. & Bro.
Mdse. pkgs., 2
Windmuller & Roelker,
Arms, cases, 20
Ward Asline,
Mdse. pkgs., 3
Order.
Casks, 14
Wire, coils, 7
Anvils, 55
Files, cks., 4

Iron.

Bussing, Crocker & Co.
Pig, tons, 190
Sheet, bdls., 500
Congreve Chas. & Son,
Rails, 2014
Champion H.
Rails, 558
Griswold J. A. & Co.
Pig, tons, 116
Holdane, Hopkins & Stokes,
Bars, 1427
Henderson Bros.
Pig, tons, 450
Holdane J. H. & Co.
Flues, 400
Jarvis Geo. R.
Rails, 2747
Lang W. Bailey & Co.
Mdse. pkgs., 4
Rails, 814
McColl Duncan,
Casks, 6
Maitland, Phelps & Co.
Pig, tons, 200
Piersons & Co.
Bundles, 51
Rods, bdls., 193
Prosser T. & Sons,
Tubes, bdls., 81
Page E. & Co.
Bars, 2430
Sampson & Bro.
Bars, 269
Smith G. G. & Co.
Sheets, 253; bdls, 214
Bars, 2513
Scroll, bdls., 80
Bar, bdls., 41
Vose, Dinsmore & Co.
Rails, 786
Van Wart & McCoy.
Bundles, 567
Whitney C. W.
Flues, 380
Whitney A. R.
Bars, 2629
Hoop, bdls., 103
Order.
Sheets, bdls., 8775
Bars, 10,513
R. R. bars, 2171
Bundles, 92

Steel.

Abbott & Howard,
Bundles, 41
Cockayne J. W.
Cases, 29
Disston H. & Son,
Mdse. pkgs., 1
Hugill Chas.
Cases, 12
Bundles, 127
Moss F. W.
Bundles, 153
Milliken S. Jr.
Bundles, 485
Naylor & Co.
Mdse. pkgs., 11
Tires, 122
Axles, 50
Slagg Joseph,
Mdse. pkgs., 38
Vose, Dinsmore & Co.
Mdse. pkgs., 3
Wardlow W. C.
Cases, 20
Bundles, 54
Order.
Bessemer rails, 742
Bundles, 140
Rails, 3021

Metals.

Baring Bros. & Co.
Lead, pigs, 1500
Borland Robt. B.
Ingot copper, cks., 13
Dickerson J. S. & Co.
Tin plates, bxs., 2671
Naylor & Co.
Tin plates, bxs., 974
Phelps, Dodge & Co.
Tin plates, bxs., 5344
Copper, cks., 157
Phelps Bros. & Co.
Tin plates, bxs., 3432
Tin, bbls, 25; ingots, 504
Schappert & Schlacter,
Copper tubes, 1904
Van Wart & McCoy,
Zinc, cks., 3
Order.
Tin plates, bxs., 8457
Lead pigs, 6699; bars, 2
Scrap, copper, pkgs, 5
Scrap, brass, pkgs., 4
Copper, bbls., 50; ingots, 116; cks., 44

Water Meters.

BY JAMES A. WHITNEY, M. E.

Few topics of a mechanical character have been more bewritten with diminutive results than that indicated by the caption of this article. Every large city in the civilized world has been compelled to provide works for the supply of water to its denizens. Sometimes, as in New York, this has been done by the municipality; sometimes, as in London, by private companies. In either case the difficulty of setting a check on consumption has acted as a premium on waste. Twenty years ago the report of the Croton Board (New York city) called attention to the fact that "a very great proportion of the water placed at the disposal of the consumer is used for no valuable or practical purpose." During the intervening period scores of inventions designed to measure the flow of water from the branch pipes of the mains and from the faucets of buildings have been devised. Of these, perhaps one in ten possessed merit enough to entitle it to thorough trial, but not one in fifty has secured any permanent foothold, as far as extended use or general introduction is concerned. But even the poorest of them would have saved at least a portion of the 60 per cent. of the water supply which is calculated to be the proportion of annual loss. Even this, high as it is, is probably below the actual ratio. An estimate made some ten years since, and based upon returns from six of the principal cities in the United States, showed the average actual cost to the city to be 8 mills per hundred gallons, while the average charges to consumers were 32 mills to the hundred gallons—the difference indicating the presumed difference between the quantity used and that supplied. But despite this high ratio of water rates, the water boards of most cities have, at one time or another, suggested the use of meters—a remark especially applicable to Chicago, where the expense of water raising and distribution resolves itself into a question of coal and steam engine repairs, and is, therefore, pretty accurately known. It may be remarked, in passing, that a surplus of water has been known to produce some notable and unlooked for results, as, for instance, in Glasgow, where the opening of the Loch Katrine water works is said to have reduced the consumption of soap to the extent of a quarter million dollars of our money the first year.

I am not now speaking in favor of any particular meter—not even in favor of any particular system. After having examined many models, I am decidedly of the opinion that not one meets all the requirements of a perfect meter, and I doubt very much whether any one can be suited to all conditions of water measurement. The apparatus that will measure accurately under a uniform head will fail under a variable pressure.

The small device fitted for a dwelling will scarcely, in its construction, suit the requirement of the three, four or six inch pipe leading to a dye works, paper factory, or like industrial establishment. Considered merely with reference to their uses, water-meters, if ever permanantly and widely introduced, will probably be classified for streams of, say, one-half inch diameter, for ordinary faucets and the like; those for pipes ranging from one to two inches diameter, and used in the supply of tenement houses and hotels, where measurement for each particular outlet would be impossible, and for steam boilers requiring more than the smaller pipe could supply; and those of the greater size required by manufactories, etc. Mechanically considered, the most available varieties of meters are the dumping meter, in which a vessel of known capacity is automatically filled and tilted to pour out its contents thus measured; the rotary meter, in which vanes or wings, either spiral or radial, moving on a central axis, are acted upon by the flow of water, a certain amount of flow through a space of known diameter producing one revolution of the device; and the piston meter, in which a piston is moved to and fro in a cylinder, by water admitted alternately at its opposite ends, in a manner similar to the action of steam in an ordinary engine, the capacity of the cylinder, *minus* the space occupied by the piston, being the measure of the water admitted and expelled at each stroke of the latter. The moving parts in each one are connected with simple clockwork mechanism moving under fingers arranged in due relation to dial plates, to record, as the case may be, the tiltings of the dumping vessels, the revolutions of the vanes or stroke of the piston.

In the adaptation of meters to the various conditions of water measuring, I am disposed to think that a somewhat bulky, but efficient, device for faucet use could be constituted by combining the ordinary spring or closing faucet with a dumping device, the former preventing neglect to shut off the flow when not required; the latter measuring the quantity actually used. This apparatus would be independent of the head. For the second-class of uses, the rotary meter, although not the most accurate, works with less friction than the piston meter, and would, all things considered, probably be preferable. The range of improvement, real or alleged, is greater in this than in any other kind of meters, for we have only to reverse the action of almost any rotary pump, and fit it with a registering mechanism, to convert it into a very tolerable rotatory water measurer. So also with a rotary steam engine: fit it with an index device, and turn a flow of water instead of steam through it, and the transformation is complete. Rotatory water meters possess one advantage over others, in the facility with which their most important parts can be shaped, by turning in a lathe either of special or ordinary construction.

For the larger pipes, two to six inches in diameter, I should recommend a piston meter, especially if the flow have any material degree of pressure; for when of large size the friction in proportion to the volume of water passed, is much diminished. On these there is some chance of profitably employing a modification to which, thus far, I have not referred. This is the differential meter so called, in which small but ascertained proportion of the flow is diverted to a measuring and recording device, to be taken as an indication from which the entire volume passed may be calculated.

These remarks have been called forth as *a propos* at the present time, when even the New York city charter is sought to be made the means of securing the adoption of a special and particular meter, a matter which, it may be readily inferred from the foregoing, seems to me impolitic and contrary to the best interests of the public, and to the great number of inventors who have devised methods more or less complete for water measurement. No meter is exact in its work, but for all practical purposes a close approximation to accuracy is sufficient. This is given by more than one or two of the meters now before the public, and it would be well if a certain standard of efficiency were established, and each water consumer left to select a meter for himself, provided it gave a reasonably accurate return of the volume passed through it.

A Peruvian Railroad.

A correspondent of the *Boston Globe*, writing of the Oroya Railroad, in Peru, says:

San Bortolome, forty-six miles from Lima, is another station. Its only importance is, that here the great retrograde to gain elevation is made; for the road, after running back a short distance, only returns some eight hundred feet above. As there is not room to make a sweeping curve, the road forms a V, at the apex of which is a turntable. Shortly before reaching this the engine is uncoupled, and, running on the table, is reversed. It then runs along on a side track to a switch, and by this backs down to what is the rear of the train, which now becomes the front. Between San Bartolome and Lurco, a distance of ten miles, the great labor of the enterprise has to be performed, there being fifteen hundred feet of bridging and twelve hundred feet of tunnelling between these places. To give you some idea of the magnitude of this enterprise, I will describe the bridge that spans the Agua de Verrugas, a wild torrent that runs through a picturesque glen situated some 12,000 feet above the level of the sea.

This extraordinary bridge was constructed by the Baltimore Bridge Company, and its dimensions have attracted general notice. It is remarkable for being the highest of its kind in the world, and for surpassing all others of the same class in its perfect system of bracings and connections. It is a viaduct structure, consisting of four deck spans, of the Fink truss type, three of which are 110 feet long, and the fourth and central span being 125 feet long. These spans rest on piers formed of wrought iron columns, and these piers are fifty feet long by fifteen wide on top. These piers are the principal features of interest, and are respectively 145 feet, 252 feet, and 187 feet. They each consist of twelve legs, forming a rectangle.

Transversely, the pier has the appearance of an inverted W; two legs batter in and two out. The outer legs have a batter of one foot in twelve, and the inner are inclined so as to make the above-mentioned shape. There are three of these W's in the pier, each containing four legs, making twelve in all. One of the most interesting features of this gigantic structure is the raising. The piers are raised within themselves, tier upon tier, the only power used in drawing up the material being a common windlass. The entire viaduct is five hundred and seventy-five feet long, and is not only the mode of crossing best adapted to the situation, but it is also the cheapest that could there be used.

Meeting of the American Rail Manufacturers' Association.—A meeting of the American Rail Manufacturer's Association was held on Friday last, in Philadelphia. Mr. Geo. R. Wood was appointed chairman, and P. E. Chase, secretary. The draft of a constitution was read and adopted, and the secretary was directed to place it before all the owners of rail mills in the country, with the request that they sign it. Letters were read from various members of the association approving of the new organization. The proposed constitution of the American Iron and Steel Association was read for information. The secretary was requested to visit or correspond with all the rail mills of the United States, to obtain full and complete information regarding them, and have the same ready to report to the next meeting. A resolution was adopted providing for the appointment of a committee of five for the purpose of securing concert of action among all the associations of the country representing the iron and steel interests, and bringing about the formation, under proper rules, of an organized combination thereof. S. M. Felton, E. Y. Townsend, Joseph Wharton, W. C. Cox, and A. J. Dull were appointed the committee. Adjourned to meet at the call of the committee.

It is proposed to form a joint stock company in Virginia, to be known as the Echols Iron Company, for mining and selling ore, and manufacturing.

In Oregon, forty miles north of the capital, there has been discovered, on a small stream called the Molalla, a large vein of cinnabar, said to be much more extensive than any yet opened in the United States.

One hundred and nineteen thousand dollars have been subscribed toward a blast furnace at Duluth. It is intended to have the works in operation before the end of the summer.

Schmidt, Kusterman & Co's. Tin Review

(Translated for The Iron Age.)

PENANG, January 18, 1873.—*Tin.*—Soon after the last mail had been dispatched, a declining tendency manifested itself, and nothing could be done except to meet a speculative inquiry for India at $34·50 @ $34 per picul. Subsequently, however, a better demand sprang up for Europe and the United States at $35, to be followed by a relapse into apathy, winding up with sales at $34·50 @ $34·60. While finishing our dispatches, the market is again firmer at $35 per picul. There are speculative holders of large amounts of tin kept out of the market. *Exchange* has been rising, and finally declining again; 4/5, bank and commercial, six months' sight.

Rautenberg, Schmidt & Co's. Singapore Metal and Coal Review,

(Translated for The Iron Age.)

SINGAPORE, January 16, 1873.—*Iron* is quiet, and without dealings. *Tin* is coming in in moderate quantities, and there being a brisk demand, prices are on the rise at $35 @ $35·75 per picul, equal to £140 14/ @ £143 15/ per ton, cost and freight. The market closes firm. Of *Coal*, considerable arrivals have taken place, but the offerings are, nevertheless, sparing. Sales are reported of 1500 tons Cardiff at $11 per ton, 3 months, and subsequently 1350 tons at $11·75, 3 months

Siemsson & Co's. Shanghae Metal and Coal Review.

(Translated for The Iron Age.)

SHANGHAE, January 2, 1873.—*Metals* have been on the whole rather quiet, although European telegraphic accounts ought to produce a different state of affairs. The quotations are the following, nominal ones: Best Dawes Nail Iron, 3·45 to 3·60 taels; common brands, 3·15 to 3·20; Rod Iron, 3·20 to 3·30. L. B. *Lead*, 4·85 taels, cash. *Tin Plates* neglected, and nominally 8 taels. English *Quicksilver*, 76½ taels; California, 79 to 80. *Coal.*—The market is dull, as heretofore, and the sales are insignificant: Cardiff, 9·75 taels; English, 9·50; American, 9·50; Sydney, 9·25; Newcastle (New South Wales), 8·80 @ 8·90; Japanese, 4·75; Formosa, 5 per ton.

The Rhenish Metal Market.

(Translated for The Iron Age from the "Frankfurter Zeitung.)

COLOGNE (PRUSSIA), 16 Feb. 1873.—*Copper and Tin* have remained quiet, but firm, while a lively demand continued to prevail for both *Lead* and *Spelter*. We quote Scotch *Pig Iron* 29½ @ 33 thalers; English, 24½ @ 25⅛; Banca Tin, 51; Billiton, 50; Lamb, 50; and Copper, 31 @ 33. All other metals unchanged.

The Dutch Tin Market.

(Translated for The Iron Age from the "Frankfurter Zeitung.)

AMSTERDAM, 18 Feb. 1873.—There has been great quietness in *Tin* during the week, and but a couple of hundred slabs Banca were taken on the spot, at 85 guilders, at which there are more sellers. Nothing is doing in Billiton, which may be had at 83 @ 83½ on the spot, and *ex* Feb. sale at Batavia, loading there per steamer, it can be bought at 82½, and afloat, soon due, at 83 guilders.

The Belgian Metal Situation.

(Translated for The Iron Age, from the Frankfurter Zeitung.)

LIEGE, February 15, 1873.—Notwithstanding the exorbitant prices which have been reached both by coal and cokes, it seems that consumption is unrestrained, the demand exceeding production all along, and the tendency of prices remains a rising one. *Pig Iron* is exceedingly scarce, and some particular brands are in great request. It is different, however, as regards nails and wrought iron. The nail manufacturers suffer from the extreme rates which the raw material now commands, and the same relates to other branches, paralyzed from the same cause. A colossal movement of emigration is developing in our midst, and will have a detrimental effect upon *Tin* production, now already put to a great stress by reason of a short supply of hands to work the mines.

Metal Matters on the Belgian Frontier.

(Translated for the Iron Age, from the Frankfurter Zietung.)

CHARLEROI, February 15, 1873.—*Metals.*—The demand for *Pig Iron* is not over brisk just at present, consumers restricting their purchases to the immediately indispensable, in hopes, as they are, that prices will give way shortly. Producers, on the other hand, cling to prevailing rates with the utmost tenacity, and one of the works has made several contracts at 19 francs. Wrought iron is steady at 32 francs as a basis, but this cannot be got with ease in all cases. *Tin Plates.*—A large business is growing up, and a rise of some importance seems to be impending. It will not last long, and we shall have risen above 40 francs. *Coals* are as firm as ever, although there has been a falling off in the demand for some kinds. Cannell coal is in great demand

Arnold, Karberg & Co.'s Chinese Metal Review.

(Condensed for The Iron Age.)

HONG KONG, Jan. 8, 1873.—*Metals.*—Although business in this line has been quiet, prices have been well sustained, and the tendency at the close is a decidedly firmer one. Stocks are not large and holders are consequently reserved, the following quotations being more nominal than anything else: Nails, Iron, $3·50 to $3·80; Rod Iron, English, $3·50 to $3·65; Swedish, $4·10 to $4·40; Hoop Iron, $4·60 to $4·80; Iron Wire, $7·20 to $8 per picul; Steel, $4 to $4·60 per tub; Common Lead, $6·20 to $6·30; L. B., $6·35 to $6·40; W. B., $6·50 to $6·60 per picul; Spelter, $35 to $36 per picul; Tin Plates, $9 to $10 per box; Quicksilver, English, $98·50 to $99; California, $99·50 to $100 per picul. Sales: 436 piculs Nail Iron, 568 Hoop, 100 Iron Wire, 60 piculs Common Lead, 400 L. B., 100 piculs Spelter, 250 cases Tin plates, and 60 piculs English and 400 piculs California Quicksilver.

The Dutch Tin Market.

(Translated for The Iron Age from the Nederlandische Courant.)

ROTTERDAM, Feb. 18, 1873.—*Tin.*—Quiet is the predominating feature of our market, and but a few transactions took place on the spot at $85·50 and $85 guilders, for Banca.

The Chili Copper Market.

(D. Shutte & Co.'s Review Condensed for The Iron Age.)

VALPRAISO, Jan. 31, 1873.—*Copper Bars.*—A lively business has been done in this article in consequence of the more favorable advices from England. There prevails great competition to buy, which circumstance enabled holders to raise their price to $19¼ per quintal, cash on shore here. For Lota and Urmeneta, $20 per quintal, free on board, has been paid. Sales, 31,382 quintals. The market closes firm, but nothing is offered. *Regulus* had been rather neglected, and only during the last few days holders succeeded in getting 10c per quintal more than the figure we quoted in our last. Transactions embrace 39,500 quintals. *Ores*—No sales. We quote nominally $3¼ @ 3½ per 25 per cent.

COPPER REPORT OF CHILI.

	1869 Quintals	1870 Quintals	1871 Quintals	1872 Quintals
Export	1,211,200	1,084,766	909,510	1,022,383
Loading Dec. 31	170,923	92,838	126,229	89,586
Charters to Jan. 14	29,160	29,779	31,375	39,969
	1,411,283	1,207,383	1,067,114	1,162,428

Freights well sustained, notwithstanding a good supply of tonnage. Nitrate to Liverpool, £2, 15s. Copper to Swansea, £2, 13s. 9d. Exchange, 45d, 90 days' sight.

Charles Thoree & Co.'s Japanese Metal Prices Current.

YOKOHAMA, Jan. 22, 1873.—*Metals*—Sales of N. R. Iron only to be reported.

	₰ picul.	Deliv'ries. piculs.	Stock. piculs.
Iron Flat and Round	$4·00 to 4·70		
" Nail Rod	3·60 to 4·80		
" Hoop, no stock	....	840	6,680
" Pig, nominal	1·25 to 1·30		
" Wire	9·00 to 10·00		

Dummler & Co.'s Java Metal Review.

BATAVIA, Jan. 8, 1873.—*Metals*—Swedish Iron is in fair demand. English remains about the same as last quoted, and few transactions are reported. Copper and Steel are quiet. *Iron Nails*—Dealers are still supplied, and as yet no sales have transpired.

J. W. Muller & Co.'s Chinese Metal Telegram.

(Communicated to The Iron Age.)

SHANGHAE, Feb. 17, 1873.—*English Nail Iron* —3·40 taels, against 3·35 Jan. 31st. *L. B. Lead*—5·10 taels against 4·85. Spanish *Quicksilver*—78 against 77. Raw Japan *Copper*, 16·75. Exchange—5/ 10¾ against 5/ 11¼.

Antwerp Metal Market.

(Translated for The Iron Age from the Revue Commerciale et Maritime.)

ANTWERP, Feb. 21, 1873.—*Metals*—The market is devoid of dealings from lack of supplies, the arrivals having been limited to 5818 tons Pig Iron from England, and 133 ingots Copper from the same quarter.

The Price of Coal at Pittsburgh.—A meeting was held on Saturday morning by the coal operators doing business along the different railroads and rivers, at the office of Thomas Fawcett & Son, on Water street. There was a full representation present. Mr. Simpson Horner was called to the chair, and W. A. M'Intosh elected secretary. The secretary read the scale of prices adopted February 21st, 1873, by the Tuscarawas Valley Coal and Mining Association, as follows:

Resolved, That the price of mining coal of standard thickness (four feet), should be ninety cents per ton from February 1st to October 1st, and one dollar per ton from October 1st to February 1st. When miners are paid one dollar per ton for mining coal, to receive five cents extra for every three inches the vein is less than four feet.

The resolution was debated at length by the members present, after which the following preamble and resolution was unanimously adopted:

Whereas, the maximum price paid for mining has been (4) four cents per bushel for many years prior to last fall, at which time a number of operators were compelled to accede to a demand of an advance to (5) five cents per bushel, owing to the temporary necessity of manufacturers and private consumers, and whereas the demand for coal, both for home and foreign trade, has since materially decreased and whereas the profits of the business are so small as not to remunerrte us for conducting the same when paying over four (4) cents per bushel; therefore

Resolved, That our business be conducted with a view to fixing the standard price for mining at four cents per bushel at all mines on the railroads, thus making the price uniform with the price of mining at the river mines, commencing not later than April 1st, 1873, and that the officers of the Railroad Coal Producers' Exchange be requested to call a meeting on Tuesday next, to take definite action, and fix the time at which the reduction shall take place.

The meeting then adjourned.

On the 14th of February the leading iron masters of South Staffordshire issued circulars to the trade in which they say: "We have this day advanced our prices of iron 20/ per ton from our circular of January 31st." This step has been taken in consequence of communications having been this morning received from Earl Dudley and Messrs. Barrows, who now lead the changes, announcing that orders can now be executed subject only to special arrangement as to prices, or at the prices current at the time of the delivery of the iron.

ERIE RAILWAY.

WINTER ARRANGEMENT of Trains taking effect Nov. 4th, 1872. From Chambers St. Depot. (For 23d St. see note below).

9·00 A. M. Cincinnati and Chicago Day Express. Drawing Room Coaches to Buffalo and Niagara Falls, and Sleeping Coaches to destination.

11·00 A. M. Express Mail for Buffalo and Niagara Falls. Drawing Room Coach to Susquehanna and Sleeping Coaches to destination.

5·30 P. M. Night Express. Sleeping Coaches to Buffalo and Niagara Falls.

7·00 P. M. (Daily) Cincinnati and Chicago Night Express. Sleeping Coaches through to Cincinnati, Buffalo, Niagara Falls, and thence to Chicago.

Additional Trains leave for

Newark, 6·30, *8·45 and 11·30 A. M., and 3·15, 5·15 and *6·30 P. M.

For Port Jervis, 8·00, 9·00, 11·00 and *11·15 A. M., 4·30, 5·30, †6·30 and *7·00 P. M.

For Goshen and Middletown, *7·30, 8·00, †8·30, 11·00 and *11·15 A. M., 3·30, 4·30, 5·30, †6·30 and *‡7·00 P. M.

For Warwick, 8·00, 11·00 and *11·15 A. M., 4·30 P. M.

For Newburgh, 8·00, †8·30, 9·00 and 11·00 A. M., 3·30, 4·30 and 5·30 P. M.

For Suffern, †7·30, 8·00, †8·30, 11·00 and *11·15 A. M., 3·30, 5·00, †6·30, 7·00 and *11·30 P. M.

For Ridgewood, Hohokus, Allendale, and Ramsey's, †7·30, 8·00, †8·30, 11·00, *11·15 A. M., 3·30, 5·00, 6·00, †6·30, 7·00 and *11·30 P. M.

For Paterson, 6·45, *7·30, 8·00, †8·30, 10·30, 11·00, *11·15 A. M., 12·00 M., *1·45, 3·30, 4·00, 5·00, 5·15, 5·30, 6·00, *6·30, *7·00, 8·30, 10·00 and *11·30 P. M.

For Rutherford Park and Passaic, 6·45, *7·30, *8·30, 10·00, 11·00 A. M., 12·00 M., *1·45, 3·30, 4·00, 5·15, 6·00, *6·30, 8·00 10·00 and *11·30 P. M.

For Hackensack and Way 5·00 8·15 and †8·45 A. M., 1·00, 4·00, 5·00, 6·00 and 6·30 P. M., and Saturdays only, 12·00 midnight.

For Hillsdale and Way, 5·00, 8·15 and †8·45 A. M., 1·00, 4·00, 5·00 and 6·00 P. M., and Saturdays only, 12·00 midnight.

For Spring Valley and Way, 5·00, 8·15 †8·45, and ·00 A. M., 1·00 4·45, 5·00 and 6·00 P. M., Saturdays only 12·00 midnight.

For Englewood 5·00, 7·45, *9·00, A. M., 1·30, 3·15 4·15, 4·45, 5·30, 6·30 and *7·45 P. M. Saturdays only, 12·00 midnight.

For Cresskill, 5·00, 7·45, *9·00 A. M., 1·30, 3·15, 4·15, 5·30, 6·30 and *7·45 P. M. Saturdays only, 12·00 midnight.

For Upper Piermont, 5·00, 7·45, *9·00, A. M., 1·30, 4·15, 4·45, 5·30, 6·30 and †7·45 P. M. Saturdays only, 12·00 midnight.

For Piermont and Nyack, 7·45 and *9·00 A. M., 1·30, 4·45, §5·30, 6·30 and †7·45 P. M. Saturdays only 12·00 midnight.

N. B.—Trains leaving Chambers street on even hours or half hours leave 23d street fifteen minutes earlier than above time. The 5·00 A. M., 10·00 and 11·30 P. M. Trains start from Chambers Street only.

N. B.—Trains on the N. R. R. and Newark Branch leaving Chambers street on quarter hours, leave 23d street thirty minutes earlier than above time.

Tickets for passage and for Apartments in Drawing Room and Sleeping Coaches can be obtained, and orders for the checking and transfer of Baggage may be left at the Company's offices: 241, 529 and 957 Broadway; cor. 125 street and 3d avenue; 4 Court street, Brooklyn; at the Company's Depots, and of Agents at the principal hotels.

* Daily. † Sundays only. *‡ Goshen Sundays only § Nyack only.

JNO. N. ABBOTT, General Passenger Agent.

The Pacific Rolling Mills.

The *Mining and Scientific Press* says: The Pacific Rolling Mills, of this city, are the only works of that character on the coast, and as such represent a very important branch of industry. They manufacture railroad and merchant iron, steamboat shafts, cranks, pistons, connecting rods, car and locomotive axles and frames, and hammered iron of every description. They have lately been making considerable additions to their machinery, etc., in order to keep up with their orders. The mill is now quite busy, running nine furnaces on iron beside those on bolts, spikes, etc. They have three trains of rolls, two 18-inch and one 8-inch train, driven by an engine of 200-horse power. Since our last visit they have added a new rivet machine and one large punch, capable of punching a nut for a 1¼ inch rod, cold. Also, two small punches, for washers and small nuts. This makes altogether seven punches on the latter class of work. An axle-turning lathe and an axle-centering lathe for cutting off any shafting cold, have been added, made at Bement & Dougherty's Industrial Works, at Philadelphia. A new bolt-header, that will make a bolt from three-fourths of an inch to one and a half inches, is running, and four machines for cutting bolts have lately been added, making altogether, in the bolt shop, nine machines. They employ boys altogether in this department, there being, with those in the mill, twenty-five employed. They have just built a new machine for cutting threads in nuts, that allows one boy to run twelve taps.

They are now turning out nearly forty tons per day of bar iron, and are working night and day shifts. Nine furnaces are running, with four on bolts, railroad-spikes, etc. About seventy boxes of railroad spikes, thirty boxes of rivets, and fifty boxes of fish-joint bolts per day are turned out, the latter finished with thread and nut. In the machine-bolt line they can turn out about four thousand bolts per day, with nut and dressed head.

About thirty-five tons of coal per day are used at the works, all of which comes from Australia in vessels, and is unloaded at the dock in front of the mills. There are five steam-hammers and five engines in the mills, and eleven boilers; one new boiler is now being made. Steam is made in most of them from the fires in the furnaces, at no additional cost. About two hundred and fifty men are at work at present in all the departments, including the bolt, forge, blacksmith, carpenter shop, etc.

A Practical View of the Chinese Labor Question.

The Economy Society, of Pittsburgh and vicinity, which seems to be an industrial or trade union, has been inquiring into the employment of Chinese at the Beaver Falls Cutlery Works. From the report made by the Society Committee, it appears that about 120 white persons and 190 Chinese are employed in the works. The men are all paid monthly, and are free to leave whenever they choose. The report goes on to say:

We have been unable to find that the directors have, in their action, or in their management of the business, violated any law or any rights of any party, but if such should be the case the courts are open to decide it. When the present board of directors took upon themselves the management of the company's business, which was only done as a last desperate effort to save it from utter ruin, they found it in a deplorable condition, heavy losses having been sustained and its capital greatly impaired. The previous efforts to save said cutlery may be well likened to the efforts of a crew on board a sinking ship freighted with a valuable cargo. They applied to their next kinsman, who, indeed, seemed willing to aid, on condition, however, that each should receive a certain portion; but upon reckoning being made it was found the proffered aid would cost not only the whole cargo, but require the ship and quite an addition beside. In this dilemma but one of the two things remained to be done—stop the works at once and entirely, which would have discharged every employe and entailed great injury, if not ruin, upon the interests of the place, or do as was done by the managers, call upon these men to do a part of the labor and strive to continue operations.

The committee think that the employment of Chinese labor is not unlawful, and that no rights have been violated by the cutlery company. The Pittsburgh *Dispatch* says that the report of the Economy Society has had a disturbing influence, and adds:

Some of the gentlemen who control the adherents of the not-to-be-peaceful view are men of a good deal of ability and influence, and it is understood that they have already decided upon attempting another plan. A bill will be presented to the Legislature asking that a heavy State tax be imposed on corporations using Chinese laborers. If this is ineffectual, which it is most likely it will be, other schemes will be tried, but violence will be decried at all times. The principal persons who still hold against the Society are the other property owners and real estate dealers not connected with the manufacturing interests, and the farmers living within eight or ten miles of the place. The workmen in the manufactories other than the cutlery works, who number about 300, have never taken the initiative, but have thus far been led by these. They will still be counseled and not act rashly.

Charles Betts, a well known iron worker, who superintended the construction of the Stevens Battery, and a number of the largest iron-clads built during the war, died on Thursday at his residence in Bridge street, Jersey City.

The new sheet and boiler iron mill, in New Castle, Pa., will be completed by the 1st of uly next, it is expected.

During the past year we have consolidated the Union and Backus Vises, retaining what we thought was best in each, and making a new Vise better than either. Hereafter all orders will be filled with this new Vise, which will be called the Millers Falls Vise.

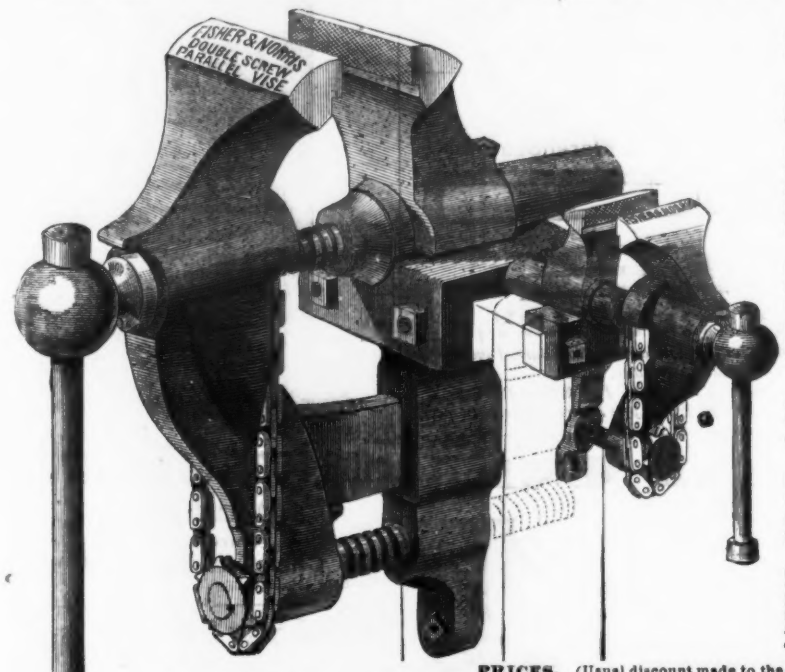
We have also commenced making a very superior Coach Makers' Vise. Our new Hand Vise is made of Solid Forged Steel, retailed at $2·00, and is meeting with universal favor. We find on careful investigation that by the pound we are selling lower than any other good Vise can be bought.

There is nothing in the market that can compete with our Six, Seven and Eight Inch Vises. All of our goods have been perfected until no fault can be found with them. They are all fully warranted, and will give entire satisfaction. They can be found in most of the Hardware Stores at our lowest prices, but in places where they are not so kept we will sell to consumers at satisfactory rates.

MILLERS FALLS CO.,

78 Beekman Street, New York.

THE DOUBLE SCREW PARALLEL VISE.



More than twenty-five years' use of this Vise by Machinists, Tool Makers, Locomotive Shops, &c., has established its superiority over every other.

It is the only one which has all the strength and "grip" o the ordinary English Vise; and at the same time with the jaws *parallel* at every point of opening.

In all other "Parellel" Vises using only one screw, *less than one-third* of the power applied is effective on the work itself; beside, in those vises the large waste of power on the slide from *friction* and the *tendency to "jam,"* of the lower end of the jaw, if screwed up very hard, renders them unfit for heavy work.

In this vise the jaws are kept *always parallel* by the lower screw moving in or out exactly with the upper, lever screw, by means of the chain connecting both: also, by their relative position *two-thirds* of the power applied at the lever screw is received by any piece held between the jaws—thus enabling the heaviest work ever required of a vise to be done with this.

The Screws are forged of the best refined iron, and work in *solid cut thread* boxes. The Jaws are faced with *best* Tool Steel, welded on, file cut, and properly tempered for wear.

The Chain is very carefully made of case hardened inside links and rivets, and, acting only to *regulate* the position of the lower screw for different points of opening, has *no direct strain* of the work upon it; it is therefore as durable as the other parts.

Only the strongest material is used in this manufacture, and from actual experiment on the six inch jaw vise, which has screws of 1¾ inch diameter and lever 19 inches long, it has been found that applied at the lever Screw, it required to break either of the jaws, *eleven and one-half tons*, thus exhibiting a maximum strength far above *any* other vise of like size.

PRICES. (Usual discount made to the Trade.)

No. 1.	Width of Jaw 3 inches, and weighing about 12 lbs.,	$6·00	No. 4.	Width of Jaw 5 inches, and weighing about 80 lbs.,	$18·00
No. 3.	Width of Jaw 4½ inches, and weighing about 50 lbs.,	14·00	No. 5.	Width of Jaw 6 inches, and weighing about 125 lbs.,	24·00

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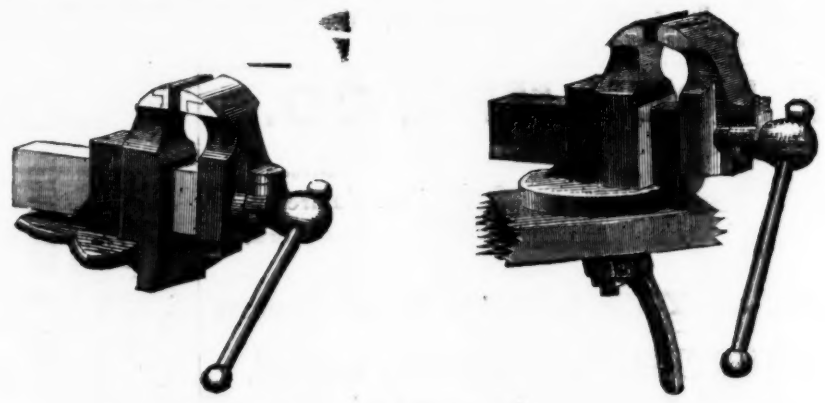
NEW YORK.—Messrs. Clark, Wilson & Co. Russell & Erwin Manufacturing Company. Messrs. Durrie & Rusher.
BOSTON.—Messrs. George H. Gray & Danforth. PHILADELPHIA.—Messrs. James C. Hand & Co. BALTIMORE.—Mr. W. H. Cole.

FISHER & NORRIS, Trenton, N. J.,

Sole Manufacturers of these Vises, and of the "Eagle" Anvils.

HOWARD
PARALLEL BENCH VISE.



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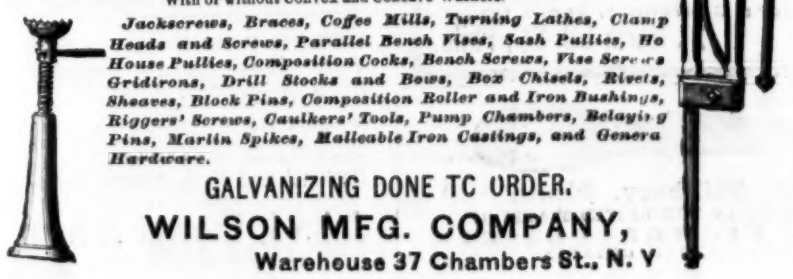
With or without Convex and Concave Washers.



Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws, Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Cocks, Bench Screws, Vise Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and Genera Hardware.

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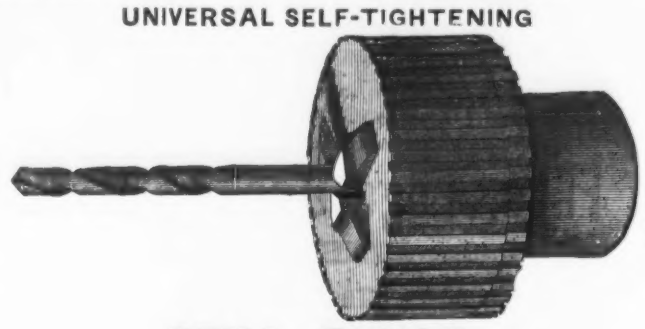

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WARWICK TOOL CO.'S PATENT

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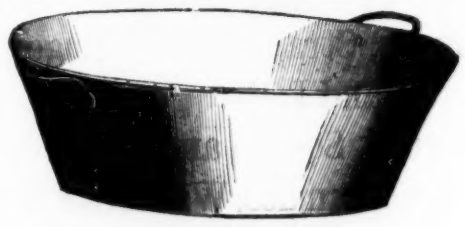

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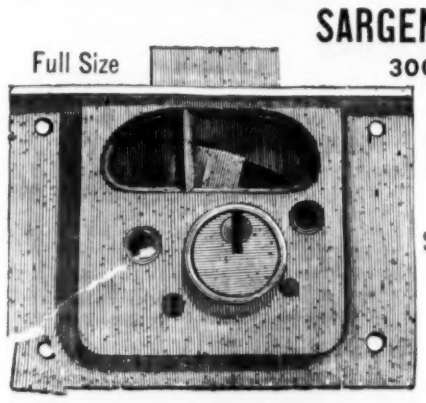

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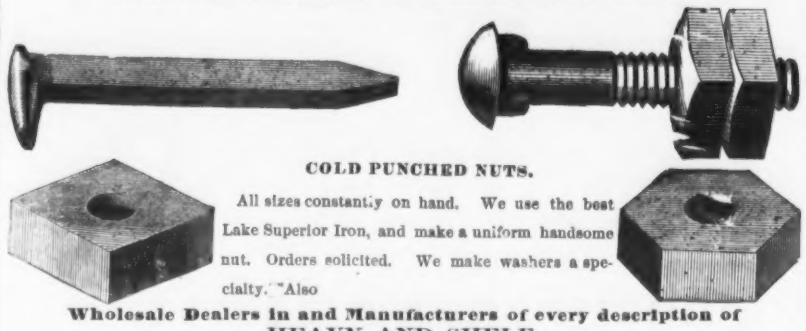

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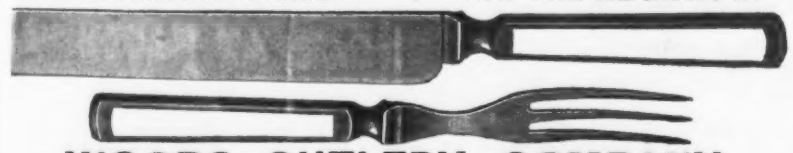

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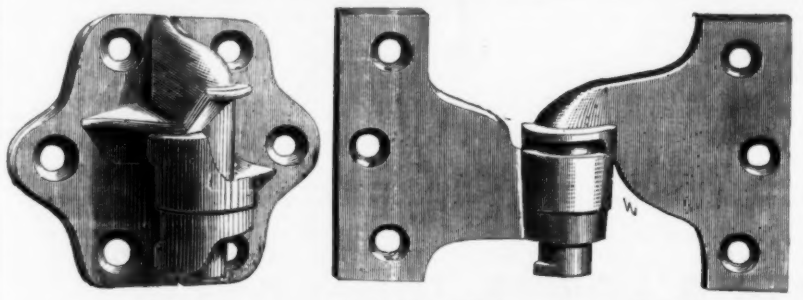

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Upper and Lower Hinges are alike, locking the top and bottom of the Blinds.

On long Blinds three or more may be used without mismatching sets, and all will fasten. They cannot be broken or closed by the wind.

☞ We would call the attention of the trade to our **Improved Revisible Self-Closing Gate Hinges.** Also our **Improved Axle Pulleys, both Iron and Boxwood Wheel, Sash Locks, Sash Bolts, &c.**

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FINE FLAT-KEYED LOCKS for all Purposes

RIM and MORTISE STORE DOOR LOCKS,

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The Best TUMBLER LOCK Ever Made.

New Pattern Key. No. 500 Yale Lock.

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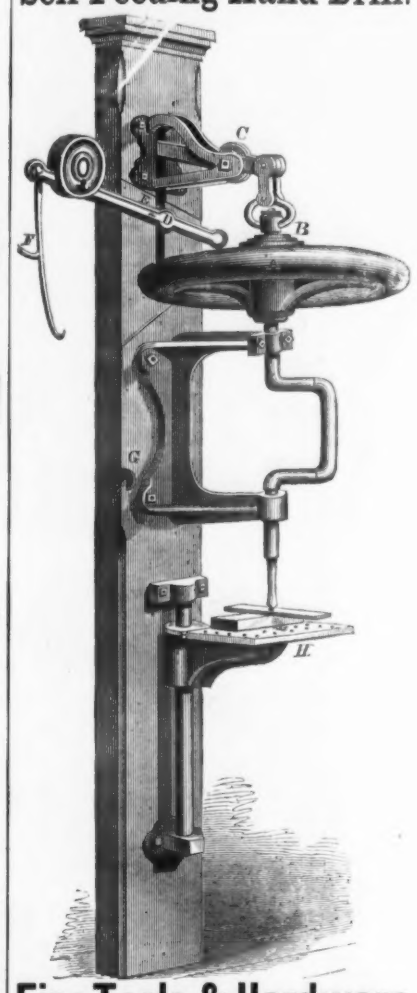

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COFFEE MILLS,

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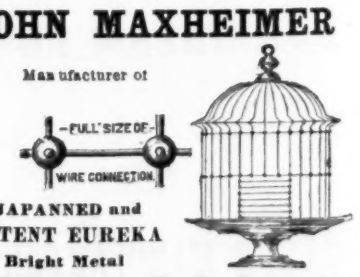

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Putnam's Horse Nails,
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HARDWARE.

Anvils.

Solid Cast Steel.....℔ lb 14c
Wright's.....℔ lb gold 12½c; over 250 lbs. 13c. gold
Armitage's Mouse Hole.....gold 12c
Wilkinson's.....℔ lb gold 11½c
Eagle Anvil Co., ℔ lb 11 cts.....dis 15 @ 15&5 %

Apple Parers.

Turn Table, Lightning, Reading, Conqueror } $8·50 per dozen.
Union.....per doz. $8 00 @ 8 50
Bay State, Paring Coring & Slicing.... 13 50 @ 15 00
Skeleton " " " 8 00
Climax Slicer.....9 00
Bay State Peach Parer..... 11 00 @ 11 50
Lightning Peach Parer..... 11 00 @ 11 50
Peach Stoner & Halver..... 6 00

Augers and Bits.

Snell Mfg. Co.....dis 15 %
Russell Jennings.....dis 10 %
Ives'.....dis 25 %
" Hollow Augers.....dis 30 %
" Expansive " .....dis 30 %
" Expansive Bits.....dis 25 %
Andrews' Bitts.....dis 20 %
Cook's Patent Augers.....dis 40 %
" " Bits.....dis 25&10 %
Shepardson's Double Cut Bits.....dis 20 %
Griswold's Patent.....dis 20 %
Cast Steel Cut Augers.....new list dis 25&10 %
Cast Steel Auger Bits.....dis 25&10 %
Long Augers.....new list dis 30 %
Bonney's Patent Hollow.....$48 per doz.—dis 25 %
Stearns' Patent Hollow.....$48 per doz.—dis 30 %
Morse's Bit Stock Drills.....dis 20 %

Axes.

Blood's.....$12 50 @ 14 00
Hunt's.....℔ doz 15 00 @ 17 50 net @ dis 5 %
Collins'.....℔ doz 12 00 @ 16 00 net @ dis 5 %
Hurd's.....℔ doz 12 50 @ 13 50
Simmons'.....℔ doz 12 00 @ 13 00
Morris'.....℔ doz 12 50 @ 13 50
Red Jacket.....℔ doz 12 00 @ 12 50
Mann's.....℔ doz 13 00 @ 14 50
Powell Tool Co., "Peerless".....℔ doz 13 00 @ 14 50

Balances.

Chatillon's, Frary's, Morton's } new list, dis 15 %

Bands.

Plated.....add 10; dis 5 %
Iron.....dis 5 %
Brass....(Plated list).....dis 5 %
Oroide.....add 15; dis 5 %

Bells.

Hand, Light Brass.....dis 55&10 %
White Metal.....dis 45&10 %
Globe.....dis 20 %
Abbe's.....dis 10 & 10 %
Taylor's Patent Door.....net
Western Gong.....net
Brook's Crank.....net list.
" Pull.....dis 15 %
Hart Mfg. Co., Crank and Pull.....net list
Cow—Common Wrought.....new list dis 33⅓ %
Western.....new list dis 33⅓ %
Kentucky "Star".....new list dis 10&10 %
Dodge's Genuine Kentucky.....new list dis 25 %
Yaw's Genuine.....dis 20 %

Bellows.

Blacksmiths'.....dis 10 %
Moulders'.....dis 10 %

Blind Fasteners.

Van Sand's.....℔ gross $14 00
Washburn's Patent.....℔ gross 14 00
Merriman's.....add 35 @ 40%

Blind Staples.

Boardman's Patent, ⅛ in. and larger.....℔ lb 37½c
" ⅜ in..... " 42 c

Bolts.

Cast Iron Barrel, Shutter, &c.....old list dis 30&10 %
Wrought Iron Barrel.....net
" " Square.....dis 10&10 %
Carriage and Tire, Common.....dis 60&10 %
Carriage and Tire, Norway Iron.....dis 40 %
Eagle, Philadelphia.....dis 40 %
Philadelphia Pattern, P. S. & W.....dis 50&5 %
Carriage and Tire, R. B. & W.....dis 50&5 %
Plow, R. B. & W.....
Stove R. B. & W.....dis 10 %
Union Nut Co.....
Machine.....dis 10 @ 15 %

Boring Machines.

Kellogg's.....dis 10 @ 15 %
Snell Mfg. Co., Rice's Patent.....dis 15 %
Snell Mfg. Co., Regular.....dis 15 %
Douglas Mfg. Co.....dis 20 %
Hovey's Angle.....$6 00 @ 6 25
Hovey's Upright.....4 25 @ 4 50
Morticing Machines, each.....$18 00

Braces.

Barber's Patent.....dis 30&10 %
Wilson Mfg. Co.....net @ add 5 %
Spofford's Patent.....dis 37½ %
Noble's Patent.....dis 33⅓ %
Bartholomew's.....dis 10&10 %
Bartholomew's Patent.....dis 25 %
Q. S. Backus & Co.....dis 30&10 %

Bung Hole Borers.

Common and Ring.....dis 20 %
Enterprise Mfg. Co.....dis 20 %
Ives' Tap Borers.....dis 20 %

Butchers' Cleavers.

Bradley's.....dis 15 %
Beatty's.....new list dis 10 %

2	3	4	5	6	7	8	9
$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co.....dis 50&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$30·25	$38·75	$43·55	$48·50	$54·00

Butts.

Wrought Brass.....new list dis 25 %
Cast Fast Joint Narrow.....dis 15 %
" " " Broad.....dis 30 %
Cast Loose Joint.....dis 40 %
" " " Mayer.....dis 30 %
" " " Parliament.....dis 30 %
Loose Pin Butts, Plain.....dis 25 %
" " Japanned.....dis 25 %
" " National.....dis 40 %
Wrought Fast Joint, Narrow.....dis 10 %
Wrought Broad.....dis 15 %
" Loose Joint.....dis 15 %
Wrought Table and Back Flaps.....net
Palmer Blind Butts.....dis 30&10 %
Nicholson Blind Butts.....dis 30 %
Parker's Blind Butts.....dis 30 %
Clark's Blind Butts.....dis 30 %
Seymour's.....dis 30 %
Shepard's.....dis 30 %
Garretson's.....dis 40 %
Standard.....dis 30 %
Union Mfg. Co.'s Drilled Fast Narrow.....new list dis 25 %
" " " " " Broad.....dis 25 %
" " " " Loose.....dis 25 %
Whitney & Wait's Bronze Metal.....dis 20 %

Caps—Percussion per 1000.

G. D.....40c
Ely's E. B.....1-4s, 67½c; 1-10s, 75c, gold
" Double Waterp'f, 1-4s, $1·57½; 1-10s, $1·65c, gold
Cole's.....1-4s, 82½c; 1-10s, 90c, gold

Cartridges.

Metallic.....dis 45 %

Cards.

Horse and Curry.....dis 20 %
Cotton.....dis 25 %
Wool.....dis 20 %

Casters.

Iron and Wood Wheel Plate.....new list dis 20&10 %
Brass Wheel Plate.....new list dis 20&10 %
Porcelain Wheel Plate.....new list dis 20&10 %

Chain.—By the Cask.

English Coil.....net gold

℔ lb.	13⅛	10⅛	9⅛	9c	8¾	8⅜
	3-16	¼	5-16	⅜	7-16	½

Trace, 6½-10-2.....℔ pair, gold, 65c
Trace, 7-10-2.....℔ pair, gold. 70c
Galvanized Pump Chain.....℔ lb 14c
German Halter Chain.....new list, gold, dis 10 %
German Coil.....new list, gold, dis 10 %
Jack Chain, Iron.....dis 35 @ 40 %
" " Brass.....dis 20 @ 25 %

Chalk.

White.....℔ gross, 50c
Red.....℔ gross, 75c
Blue.....℔ gross, 85c
Crayons.....℔ gross, 14c

Cherry Stoners.

"Family".....℔ doz $9 00

Chisels.

Socket Firmers.....dis 60 % } Cash in 30 days
Socket Framing.....dis 60 % } an extra 5 %
Socket Corner.....dis 60 % }
Tanged Firmers.....dis 40 @ 40&10 %
Butcher's.....$5 00 to £ gold—new list
Spear & Jackson's.....$5 00 to £ gold—new list

Clips, Axle.

Norway or Best.....dis 20 @ 30 %
Superior.....dis 40&5 %

Coal Shovels.

Iron Handled.....℔ doz, $ 85 @ 1 25
Wooden Handled.....℔ doz, 1 00 @ 2 00

Coal Hods.

Smith, Burns & Co.....dis 25 %

No.	14	15	16	17	18	
Japanned,	$9·00	9·75	10·50	12·00	13·50	per doz
Galvanized,	13·00	14·50	15·50	17·50	19·50	"

Cocks.

Brass Racking.....dis 10&10 %
Lock & Globe.....dis 10 %

Coffee Mills.

Common Board and Box.....dis 10&5 %
Better Grades.....dis 10 %
Increase Wilson's.....new list.....dis 10 %
French Steel.....dis 10 @ 20 %
"Champion".....dis 20 %

Compasses and Dividers.

Bemis.....dis 15&15 @ 20&5&15 %
Excelsior.....dis 30 %
Peck, Stow & Wilcox.....dis 20 %

Coopers' Tools.

Bradley's.....dis 15 @ 20 %
Chas. E. Little.....dis 15 @ 20 %

Corn Knives and Cutters.

Bradley's.....list net

Crucibles.

Gautier & Co.....℔ No. 5½c

Curry Combs.

Hotchkiss' and Kellogg's, Iron and Brass.....dis 10 %
Fitch's.....dis 20 %
Ruggles'.....dis 15 @ 20 %
Rubber.....℔ doz, $9 00—dis 10 %

Curtain Pins.

Silvered Glass.....dis 40&10 %

Cutlery.

American Table.....
American Pocket.....dis 15 %

Door Springs.

Torrey's Patent.....$7 50 ℔ doz—dis 20&10 %
J. Palmer.....℔ doz $5 50

Drawing Knives.

.....dis 60 %—Cash in 30 days an extra 5 %
Bradley's.....dis 25 %

Drills.

Ingersoll's Ratchet (Wrought Iron).....dis 25 %
No. 1, 12-in., $6 50 each; No. 2, 16-in., $8 75 each; No. 3, 20-in., $11 00 each.

Egg Beaters.

Monroe's.....℔ doz net $8 25 @ 8 50
Ashley's.....℔ doz net 2 25 @ 3 00
Earle's Patent.....℔ doz net 5 50 @ 6 00
Pratt's Aerating.....dis 10 %
Dover.....℔ doz net $6 00

Emery.

Genuine Chester—Regular Nos.....℔ lb 8c } dis 5 %
" Flour and FF.....℔ lb 5c }
Washington Mills—Regular Nos.....℔ lb 8c
" Flour.....℔ lb 5c

Enameled and Tinned Ware.

Kettles.....dis 10 %
Sauce Pans, Glue Pots, &c.....dis 5 %

Faucets.

Cork Lined, Wood.....dis 50 @ 50&10 %
Fenn's.....dis 50 %
" Cork Stops.....dis 40 %
Star.....dis 55&10 %
Frary's Patent Petroleum.....dis 10 & 10 %
Taylor's Pattern Petroleum.....dis 20&10 %
Wood and Metallic".....dis 40 %

Files.

American Best.....$5 00 to £ net
Nicholson—Mill.....5 00 to £ net
" Others.....5 00 to £ net
" Tapers (single cut).....5 00 to £ net
J. & Riley Carr's,.....5 50 to £ gold
Stubs'.....8 00 @ 8 25 to £ gold
Butcher's.....5 50 to £ gold
Spear & Jackson's.....5 50 to £ gold
Hargreaves, Smith & Co.'s.....4 75 to £ gold
Jowitt's.....5 25 to £ gold
"Western".....5 00 to £ net
W. K. & C. Peace's "Imperial".....5 25 to £ gold
R. Ibbotson.....5 00 to £ gold
Beam & Murray, "Cyclops".....4 85 to £ gold
Fisher,s.....4 75 to £ gold
Goodlad's.....4 00 to £ gold
Moss & Gamble.....5 25 @ 5 50 to gold

Fluting Machines.

Acme.....$7 00 each net
Cole.....5 75 each net
Manvill, No. 2.....7 00 each net
Knox, with 4-inch Rolls.....5 00 each net
" " 6 " " .....6 00 each net
O. K.....6 50 each net
Excelsior, No. 1.....4 75 each net
" " 2.....6 50 each net
Diamond.....7 50 each net
Climax, 7-inch Rolls.....8 00 each net
" 4½ " " .....6 50 each net
Empire.....4 00 each net
Eureka, No. 1, 7-inch Roll.....8 00 each net
" No. 2, 5-inch Roll.....6 00 each net
K. F. M., 4½ inch Roll.....5 50 each net
" 6-inch Roll.....6 00 each net
Carpenter's Self-Heating.....13 50 each net
Fairy, Self Heater.....10 00 each net
National, 5-inch Rolls.....5 00 each net
Myer's Fashion Fluter, 4½ inch Rolls...8 00 each net

Fry Pans.

Tinned—dis 20 %

℔ doz.	$3·00	3·25	3·62	4·00	4·50	5·00	5·50	6·00	7·50
No.	0	1	2	3	4	5	6	7	8

Peck, Stow & Wilcox.....dis 20 %
Smith, Burns & Co., "Excelsior" Polished..dis 20 %

$3·70	4·00	4·70	5·30	6·00	7·00	8·00	9·00 per doz.
No. 1	2	3	4	5	6	7	8.

Hammers.

Maydole's.....new list net
Cheney's.....new list net
Verree.....dis 5 %
Yerks & Plumb.....new advanced list dis 5 @ 10 %
Emmet Hammer Co.....dis 10 %

Handles.

Hammer and Hatchet.....dis 10 %
Quakertown, Axe, Pick and Sledge.....dis 10 %
" Hammer and Hatchet.....net

Harness Snaps.

Judd's.....
Fitch's.....dis 30 %

Hatchets.

Isaiah Blood.....dis 10 %
Shingling, Nos. 1 2 3.....℔ doz $7 50 8 00 8 50
Claw, " 1 2 3.....℔ doz 8 50 9 00 9 50
Lathing, " 1 2 3.....℔ doz 7 50 8 00 8 50
Hunt's.....net
Shingling, Nos. 1 2 3.....℔ doz $7 25 8 00 8 75
Claw, " 1 2 3.....℔ doz 7 75 8 50 9 25
Lathing, " 1 2 3.....℔ doz 7 50 8 25 9 00
Hurd's.....dis 20 %
Shingling, Nos. 1 2 3.....℔ doz $8 00 8 50 9 00
Claw, " 1 2 3.....℔ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....℔ doz 8 00 8 50 9 00
Newark Edge Tool Co's.....dis 25 %
Shingling, Nos. 1 2 3.....℔ doz $6 50 7 00 7 50
Claw, " 1 2 3.....℔ doz 7 25 7 75 8 25
Lathing, " 1 2 3.....℔ doz 6 50 7 00 7 50
Yerks & Plumb.....dis 10 %
Shingling, Nos. 1 2 3.....℔ doz 7 00 7 50 8 00
Claw, " 1 2 3.....℔ doz 7 50 8 00 8 50
Lathing, " 1 2 3.....℔ doz 7 00 7 50 8 00
Simmon's.....dis 10 @ 15 %
Shingling, Nos. 0 1 2 3...℔ doz 7 50 8 00 8 50 9 00
Claw, " 1 2 3...℔ doz 9 00 9 50 10 00
Lathing, " 1 2 3...℔ doz 8 00 8 50 9 00
Broad, " 1 2 3...℔ doz 9 00 10 00 12 00
" " 4 5 6...℔ doz 14 00 16 00 18 00
" " 7 8...℔ doz 20 00 22 00
J. P. Verree & Co.....dis 5 %
Shingling, Nos. 1, 2, 3.....℔ doz $7 00 7 50 8 00
Claw, " 1, 2, 3.....℔ doz 7 50 8 00 8 50
Lathing, " 1, 2, 3.....℔ doz 7 00 7 50 8 00

Hinges.

Wrought Strap and T.....dis 15 %
Providence Plate.....6 & 8 in. list 11c } dis 5 %
over 8 in. " 9½c }
Screw Hook and Strap..{ 8, 10, 12 in. 8¾c } net
{ 14 to 36 in. 7¾c }

Hoes

Solid Shank, C. S.....℔ doz $8 00—dis 20 @ 25 %
Socket, C. S.....℔ doz 9 00—dis 20 @ 25 %
Riveted Eye.....℔ doz 5 00—dis 20 @ 25 %
Planters'—Winsted.....add 10 %
Scovill.....add 33⅓ %
Scovill Pattern (Winsted).....add 20 %

Hooks.

Belt.....dis 50 %
Bench.....
Wardrobe, Japanned.....℔ doz net $5 00 @ 8 50
Hat and Coat " .....new list dis 10&10 %
Wrought Staples and Hooks and Staples.....dis 60 %
WroughtHasps and Staples and Hasps, Hooks and Wrought Staples.....dis 60 %
Screw Hooks and Eyes, revised list.....dis 60&5 %

Horse Nails.

Putnam's.

No.	5	6	7	8	9	10
	32c	28c	26c	25c	24c	23c

In lots 1000 lbs. dis. 5 %.
Aussable.

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c

In lots of 1000 lbs. 5 % discount.
Brundage.

No.	5	6	7	8	9	10
	29	26c	24c	23c	22c	21c

In lots of 500 lbs., dis 5 %
American Pressed.

No.	5	6	7	8	9	10
	22c	20c	20c	20c	20c	20c

Perkins Finished, (ready to drive).

No.	5	6	7	8	9	10
	29	26	24	23	22	21c

Buffalo Forged.

No.	6	7	8	9	10
	28c	26c	25c	24c	23c

Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished), Extra Finish.

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c

In lots of 1000 lbs., dis 5 %.
Vulcan.

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

In lots of 500 lbs., 5 % discount.
" 1000 lbs., 7½ % discount.
New London Horse Nails.

No.	6	7	8	9	10
	27c	25c	24c	23c	22c
WB.	29c	27c	26c	25c	24c

In lots of 1000 lbs., dis. 5 %.
Star Brand.....℔ lb 16c
Morgan.....16c

Horse Shoes.

Burden.....℔ keg, $6 25
R. I. Horse Shoe Co., Perkins' Pattern...℔ keg, 6 25
" " R. I. Pattern.....℔ keg, 6 75
Mule Shoes.....℔ keg, 7 25

Kettles.

Enameled.....dis 10 %
Brass.....℔ lb 55c
In lots of 500 lbs.....℔ lb net 50c

Knives.

Butcher and Shoe, "Ames".....dis 15 %
Butcher and Shoe, "Wood's".....dis 5 % cash
Hay and Straw, "Wadsworth's".....dis 15 %

Knobs.

Base—Common.....net
" Plush Tip.....dis 10 %
Elastic End.....reduced list..dis 10&10 %

Lanterns.

Brady's Patent.....dis 10 %
Ætna.....dis 10 %
Yankee.....dis 10 %
De Beque.....dis 10 %

Locks and Latches.

Pad Locks, (Mallory, Wheeler & Co).new list dis 40 %
Pad Locks, (R. & E. Mfg. Co).
Revised list Sept. 10th, dis 40&2 %
Cabinet—Eagle.....dis 25 %
Cabinet—Gaylord.....dis 25 %
Trunk.....dis 10 %
Continental.....dis 15 %
Shepardsons.....dis 20 %

Meat Cutters.

Dixon's (P. S. & W).....dis 5 %

No.	1	2	3	4
℔ doz.	$14 00	$17 00	$19 00	$30 00

Hales'.....dis 10 %

No.	11	12	13
℔ doz.	$27 00	$33 00	$42 00

Perry's Champion (P. S. & W).....dis 5 %

No.	280	300	400
℔ doz.	$22 00	$27 00	$40 00

Woodruff's (P. S. & W).....dis 5 %

No.	100	150
℔ doz.	$15 00	$18 00

American.....dis 25 @ 25&5 %

No.	1	2	2½	3	4	5
Each	$6 00	$9 00	$14 00	$15 00	$30 00	$75 00

Molasses Gates.

Stebbins' Pattern.....dis 50&10 %
Tinned ends.....dis 40&10 %
Weed's Patent Self-Boring.....dis 15 %
" without Auger Bit.....dis 40 @ 50 %
Patent Self-Measuring.....per doz $42 00—dis 20 %

Mouse Traps.

Wood Choker.....18c ℔ doz holes

Nails.

10d Cut (Standard).....℔ keg $5 25

Nuts and Washers.

Cold Cut Nuts.....3c off list
Hot " " .....3c off list
Washers, (as to quality).....less 3c @ 6c off list

Oil Stones.

Washita No. 1.....℔ lb 22c @ 25c
Washita Slips.....℔ lb 44c @ 50c
Hindostan.....℔ lb 7c
Hindostan Slips.....℔ lb 10c net

Oilers.

Olmsted's.....dis 25&10 %
Broughton's.....dis 25&5 %
Common Zinc, Brass and Copper.....dis 20 %

Picks.

Washoe R. R. Nos.	1	3	3	4	5
per doz.	$14·00	15·00	16·00	17·00	18·00
Washoe Coal, "	$8·50	9·00	10·00	11·00	13·00	15·00

Picture Nails and Knobs.

Richards' Patent.....dis 40 @ 40&10 %

Planes.

Auburn Bench and Fancy.....dis 15 %
Bailey's Patent Adjustable.....dis 15&10 %
Howland's Bench and Fancy.....dis 15 %
Chapin's " " .....dis 15 %
Chapin's, 2d quality.....dis 15&5 %
Sandusky Tool Co.....dis 15 %
"Ogontz".....dis 15&5 %
Plane Irons.....hst net
" " Butcher's.....$5 00 to £ gold—new list
" "Spear & Jackson's.$5 00 to £ gold—new list
" " Sandusky Tool Co.....list net

Pumps.

Douglas Cistern, etc.....new list dis 25 %
" S. & F.....new list dis 20 %

Rakes.

Cast Steel.....dis 25

$8 00	$9 00	$10 00	$11 00
8	10	12	14 teeth.

Razor Straps.

Genuine Emerson (R. F. Badger).....dis 33⅓ %
Hunt's.....dis 25&10 %
Chapman.....dis 10 @ 15 %

Rivets.

Iron and Tinned.....dis 25 %
Copper Rivets and Burrs.....net @ dis 10 %

Rods.

Stair.....new list dis 25 %
American Patent.....dis 25 %

Rope.

Manufacturers' List.

Manila.....½ inch and larger ℔ lb 18c
" .....¾ inch ℔ lb 18½c
" .....¼ & 5-16 inch ℔ lb 19c
" Lath Yarn.....℔ lb 19c
" Hay Rope.....℔ lb 18½c
Jute.....℔ lb 12c
Sisal.....½ inch and larger, ℔ lb 15½c
" .....⅜ inch ℔ lb 16c
" .....¼ & 5-16 inch ℔ lb 16½c
" Hay Rope.....℔ lb 16c

Rules.

Boxwood and Ivory.....dis 60&10 %

Sad Irons.

.....℔ lb 5½ @ 6c

Sand Paper—dis 7½ @ 10 %

Beader & Adamson's (Flint) 00 to 1½...$4 50 ℔ ream
" " " 2, 2½ &3... 5 00 "
Assorted.....4 50 "
Star.....℔ ream $3 50
Emery.....℔ ream $7 00 @ 12 00

Sash Locks.

Clark's.....dis 25 @ 30 %
Ferguson s.....dis 20 @25 %
Champion.....per gross $12 00 @ $15 00
Norwich.....dis 15 %

Sash Weights.

Solid Eyes.....℔ lb 3¼c

Sausage Fillers.

Perry's (P. S. & W).....dis 5 %

No.	1	0
℔ doz.	$15 00	$21 00

Saw Rods.

.....list net

Saws.

Spear & Jackson's.....$4 50 to £ gold
John Spear.....$2 60 to £ gold
Am. Saw Co.....new list
Perforated Cross Cuts, all kinds.....68c per 1001
Inserted Tooth.....dis 10 %
All else.....dis 12½ %
Disston's Cross Cut, Circular and Mill.....dis 12½
Hand, Panel, Back, &c.....dis 7½
Butcher Bow Saws, Butcher Saw Blades, Hack Saw Blades.....
H. W. Peace s Circulars.....dis 10
Other kinds.....d's 10
Wm. McNiece's Hand, Cross Cut and Circular.....new 1st dis 10 %
Lightning.....new list..dis 20& 12½ %

Scales.

Fairbanks'.....new list.....dis 15 @ 20 %
Howe's.....dis 15&5 %
Shattuck's Counter and Union.....dis 15 %
National Platform.....dis 25 %
Eureka.....dis 25 %
Scale Beams.....dis 20 %
No. 1 300 to 1200 lbs.....90c. ℔ cwt
No. 2 " " .....75c ℔ cwt

Screws.

American and National Screw Cos.
Iron.....revised list dis 50 %
Round Head Iron.....dis 40 %
Brass.....dis 40 %
Round Head Silver Capped.....new list dis 20 %
Patent Gimlet Point Coach and Hand Rail..dis 10 %
Bed.....list ne

Scythes.

Blood's German Steel, Grass.....℔ doz $ 9 00
" Cast " " .....℔ doz 10 00
" Silver " " .....℔ doz 11 00
" German " Grain.....℔ doz 13 00
" Cast " " .....℔ doz 14 00
" Red Rover.....12 00
" Young America.....12 00
" Silver Clipper.....12 63
Scythe Snaths.....dis 20 %

Shears.

Cast Steel.....dis 60 @ 60&5 %
Seymour's.....dis 60 %
Conn. Cutlery Co., new brand.....dis 60 %

Shovels and Spades.

Ames.....list July 1, '70, list net @ dis 2½ %
Rowland.....new list Feb. 8, '73, dis 20 %
Old Colony.....dis 2½ %

Shovels and Tongs.

Iron Head.....list net
Brass Head.....
Polished Steel.....dis 5 %
.....new list dis 15 %

Slates.

Square Frames, R'd Corn'd, by case.....dis 60&10 %
Less than a case.....
Oval Frames, by case.....dis 50 @ 55 %
Less than a case.....dis 40 @ 40&10 %

Spoons.

Iron.....new advanced list ....dis 10 %
By the case.....dis 10 %
Britannia.....dis 20 %
Plated A 1.....dis 25&10 %
German Silver.....dis 25&5 %
Tinned (P. S. & W.)—add 5 %
Teas.....$1.50 ℔ gross, net
Tables.....2·75 "

Stocks and Dies.

.....dis 15 %

Stove Polish.

Joseph Dixon's.....℔ gross $6 00 @ 6 25
Gold Medal.....℔ gross $5·50

Squares.

Steel.....dis 50 %; full cases, dis 50& 0 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2 50 @ $4 00 ℔ doz net
Try Squares and T Bevels.....dis 40&10 %
Star Try Squares and Bevels.....dis 20 %

Tacks.

Full Weight American Iron.....dis 40&7½ %
Half Weight American Iron.....dis 40&7½ %
Carpet.....dis 70&7½ %
Brads American.....dis 7½ %
Finishing Nails.....dis 50&7½ %

℔ lb.	½	⅝	¾	⅞	1	
	25	20	17	14	12½c	dis 7½ % 1 in. and over

Trunk and Clout.....dis 7½ %

℔ lb.	½	⅝	¾	⅞	1	
	25	20	17	14	12½c	dis 7½ % 1 in. and over

Copper Tacks.....
Iron Shoe Nails, ℔ lb 4-8 and longer, 10c; ℔ lb 56c—dis 7½ %
3½-8, 10½c
Double Pointed.....new list dis 33⅓

Tapes, Measuring

American Flask and Cap Co.....dis 10&10 %
Eddy's.....dis 10&10 %

Toe Calks.

.....per ℔ 12c

Tobacco Cutters.

Champion.....
Peck, Stow & Wilcox.....dis 20
.....dis 10 %

Traps.

Newhouse.....
Hotchkiss.....dis 17½ %
Peck, Stow & Wilcox.....dis 20 %
Blake's Patent.....dis 30 %

Vises.

Trenton Vises, Solid Box.
30 to 110 lbs.....17c
111 to 160 lbs.....18c
160 and over.....21½c
Peter Wright's.....
Wilson's Solid Box.....℔ lb 15½c. gold
39 to 160 lbs.....dis 10 %
160 and upward.....18c
Backus & Union, Parallel.....21c
Buffalo, Parallel.....dis 25 %
Fisher & Norris' Double Screw Par....dis 15 @ 15&5%
Bright and Annealed.....Nos. 0 @ 18 dis 20 @ 25 %
" " .....Nos. 19 @ 26 dis 30 @ 35 %
" " .....Nos. 27 @ 36 dis 35 @ 40 %
Coppered.....Nos. 0 @ 18 dis 15 @ 20 %
Galvanized.....dis 35 @ 40 %
Tinned.....dis 15 @ 20 %
Cast Steel.....net @ 5 %
Tinned Broom Wire.....dis 20 @ 25 %
Galvanized Telegraph, Nos. 8 & 9.....℔ lb 10 @ 11c
" " " 10 & 11.....℔ lb 11 @ 12c
" " " 12.....℔ lb 11½ @ 12½c
Annealed Fence, Nos. 8 & 9.....dis 20 @ 25 %
" Grape, " 10 to 14.....dis 20 @ 25 %
Fence Staples.....℔ lb 10c

Wrenches.

Baxter's Adjustable "S".....dis 30 %
Baxter's Diagonal.....dis 30 %
Collins & Co.'s.....new dis list 30 %
Coes' Genuine.....dis 30 %
Coes' Pattern (Wrought).....dis 45 %
" " (Malleable).....dis 50 %
Lindsay's Patent.....dis 25 %
Taft's Pattern.....dis 25 %
Davis' Patent Duplex.....dis 40 %

METALS.

IRON.—DUTY: Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron.

AMERICAN.

Foundry No. 1.....℔ ton $50 00 @
Foundry No. 2....." 44 00 @ 48 00
Gray Forge....." 40 00 @ 42 00
White and Mottled.....

SCOTCH.

Gartsherrie.....@ 60 00
Coltness.....62 50 @ 65 00
Glengarnock.....57 00 @ 58 00
Eglinton.....55 00 @ 56 00

Bar Iron.

Am. Refined, at mill.....℔ ton, 100 00 @

Rails.

Welsh, gold.....℔ ton, 70 00 @
American, at works, currency.....80 00 @
Old Rails, D. H.....gold " 51 00 @ 52 00

Scrap Iron.

Wrought Scrap, from yard.....57 50 @ 6 00

Bar Iron from Store.

Common Iron.
- ¾ to 2 in. round and square ... ₩ ton $100 00
- ⅝x9-16 in. " " " ... " 105 00
- ½ in. " " " ... " 107 50
- 9-16 to 3 in. " " " ... " 105 00
- 6 in. wide x ⅜ and 1 in. thick ... " 100 00
- ½ to 6 in. wide x ⅜ & 5-16 in. thick " 105 00
- and 1¼ in. x ⅛ and 5-16 ... " 107 50

Swedish Iron.
- 1⅛x⅜ and ½ ... ₩ ton 160 00
- 1½x⅜ to ⅝, and ¾ square ... " 155 00
- 1¾ to 5x¾ to ¾ and ⅞ to 2-in. square " 150 00
- 6 to 12x⅜ and ½ ... " 160 00

Refined Iron.
- ¾ to 2 in. round and square ... " 107 50
- 1 to 6 in. wide x ⅜ to 1 thick ... " 107 50
- 1¼ to 6 in. wide x ⅛ and 5-16 thick ... " 112 50
- 1 and 1¼ x ⅛ and 5-16 ... " 115 00

Large Rounds.
- 2⅛ to 2⅞, round and square ... " 125 00
- 3, 3¼ and 3½ in. ... " 120 00
- 3¾ and 4 in ... " 127 50

Rods—⅜ and 11-16, round and square ... " 112 50
- ½ and 9-16, " " " ... " 117 50
- 7-16, " " " ... " 120 00
- ⅞, " " " ... " 123 00
- 5 16, " " " ... " 130 00
- ¾ " " " ... " 135 00
- 3-16, " " " ... " 155 00

Band Iron.
- 1 to 6 in. x 3-16 to No. 12 ... " 125 00

Horse Shoe Iron.
- ¾ and ⅞ x ⅜, to ⅝ ... " } 127 50
- 1 x ⅜, to ⅝ ... " }

Ovals, Half Ovals and Half Rounds.
- ¾ to 1⅜ ... ₩ ton 132 50
- ⅜ and 11-16 ... " 137 50
- ½ and 9-16 ... " 142 50
- 7-16 ... "
- ⅜ ... "

Nail Rods
- UB ... ₩ ₤ 9½c

Norway Shapes
- ⅜ to 2 in x ⅜ to ¾ ... " 9¾c
- ¾ to ¼ square ... " 9¾c

Norway Bar.
- ⅜ to 2 in. square ... " c

Spring Steel.
- 1 to 4 in. wide ... " 9½c

Tire Steel
- ⅜ to 1½ x ¼ & 5-16 ... " 9¾c
- ⅜ & 1 x 3-16 ... " 9¾c
- ⅜ & 1 x ¼ ... " 10¾c

Toe Calk Steel
- ⅜ to ⅞ x ⅜ to ½ ... " 8¾c

Plow Steel.
- 6 to 16 wide ... " 9½c

Sleigh Shoe Steel
- ⅛ to 1½ x ⅜ to ½ ... Stock ... " 7½c

Hoops, ⅜ x No. 22 ... ₩ ton 180 00
- ⅜ x No. 20 ... " 150 00
- ⅜ x No. 19 ... " 145 00
- 1 and 1¼ x No. 18 ... " 140 00
- 1¼ to 2 and 1x1½ x No. 13 & 14. " 135 00

Scroll Iron—½x12 ... " 160 00
- " " 10 ... " 155 00
- " " 3-16 ... " 140 00
- " " ¼ ... " 145 00
- " ⅛ x 14 ... " 160 00
- " " 12 ... " 155 00
- " " 10 ... " 150 00
- " " 3-16 ... " 145 00
- " " ¼ ... " 140 00
- " ¾ x 14 ... " 150 00
- " " 12 ... " 145 00
- " " 10 ... " 140 00
- " " 3-16 ... " 135 00
- " " ¼ ... " 132 50
- " ⅞ x 14 ... " 145 00
- " " 12 ... " 140 00
- " " 10 ... " 135 00
- " " 3-16 ... " 132 50
- " " ¼ ... " 130 00

Sheet Iron.

		English.	American
oz. 10 to 20	₩ ₤	6¼c	8c
21 to 24	"	7¼c	8¼c
25 to 26	"	7½c	8½c
27	"	7¾c	8¾c
28	"	8c	9c
30	"	8¼ @ 9c	
Galvanized, 10 to 20	₩ ₤		12c
21 to 24	"		13c
25 to 26	"		14c
27	"		15c
atent Polished	"		15 c
Russia	Nos. 8 @ 11,	"	20c @ 22 c
"	Nos. 12 @ 16,	"	20c @ 22 c
Belgian		"	13 c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

4½	5	5½	6	7	inch.
$3 75	4 25	5 25	5 25	6 50	per doz.

RUSSIA IRON.

4½		5½	6	7	inch.
$7 00	13 00	00	13 00	14 00	per doz.

Brass.

ROLLED AND IN SHEETS.

(Brown & Sharp's Gauge.*)

For the purchase of 100 pounds and over at one time:

HIGH BRASS.
- All Nos. to No. 28, and widths 14 in. and under ... 40c
- All Nos. to No. 28, inclusive and widths over 14 to 24 in. inclusive ... 43c
- Over 20 in. to 30 in., inclusive ... 46c
- Half-cent ₩ ₤ advance on each No. above No. 28 to 38, inclusive.
- All Brass thinner than No. 38 is Platers' Brass at ... 59c
- Sheets 24x48 in., and all sheets cut to particular sizes and lengths ... 46c
- Printers' Rules ... 50c
- Sheets wider than 30 in. and under 40 in ... 50c
- " 40 " and over ... 52c
- Circular sheets, in diam. from 6 in. to 14 inclusive. 50c
- Circular sheets, in diam. over 14 in. to 20 inclusive. 53c
- Circular sheets, in diam. over 20 in. to 30 inclusive. 56c
- Circular sheets, in diam. over 30 in. to 40 inclusive. 59c
- Circular sheets, in diam. over 40 in ... 62c

LOW BRASS.
- 4 cents ₩ ₤ more than High Brass.
- Gilding Metals, 7c. ₩ ₩ more than High Brass.
- Platers' or Gold Metal { In Bars ... 52c / Sawed ... 55c

FOR SLITTING: Metal in Width,
- in. to ¼ in., to No. 30, inclusive, 1c. ₩ ₤ advance.
- in. to 1 in., thinner than No. 30, 2c. ₩ ₤ advance.
- in. to ½ thinner than No. 30, 3c. ₩ ₤ advance.
- ½ in. and less to No. 30, 2c. ₩ ₤ advance.
- ½ in. and less thinner than No. 30, 5c. ₩ ₤ advance.

10 ⅌ discount.

SCRAP.
- High Brass Scrap, 21 cents, net.
- Low " 23 " "
- Gilding, 95 cents, net.

Turnings, Filings and Chips, half the price of Scrap, net.

BRASS AND COPPER WIRE.

(Stub's Wire Gauge.)

	High Brass.	Low Brass.	Gild'g and Cop'r.
Nos. 0 to 20	43	47	53
Nos. 21, 22, 23	44	48	54
Nos. 24 and 25	45	49	55

Brass Wire straightened and cut, 4 cents advance.

10 ⅌ discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gil andd'g Cop'r.
No. 26	0·45	0·49	0·55
No. 27	0·48	0·52	0·58
No. 28	0·50	0·54	0·60
No. 29	0·52	0·56	0·62
No. 30	0·54	0·58	0·66
No. 31	0·56	0·60	0·70
No. 32	0·60	0·64	0·75
No. 33	0·64	0·68	0·85
No. 34	0·68	0·72	0·95
No. 35	0·73	0·77	1·07
No. 36	0·82	0·86	1·19
No. 37	1·02	1·02	1·32
No. 38	1·32	1·32	1·62

Ten cents per pound extra for Spooling.

TUBING

(Brown & Sharp's Gauge.)

₩ ₤

Plain to No. 20, inclusive ... $0·56
- Nos. 21, 22, 23, 2c. advance on List for each No.
- Nos. 24, 25, 26, 4c. " " " "
- Above No. 26 special rates.
- Plain Tube, 1-4 inch ... 72
- " " 3-16 " ... 1 57
- " " 1-8 " ... 1 82
- All Mandrel-Drawn Tubes 5c. advance on List.
- Fancy Tubing 4c. advance on List above Plain.
- English, Scotch, and Extra Patterns Fancy Tubing to No. 20 ... 66
- Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
- Add to two cents a half-cent for each additional cutting under two feet.

10⅌ discount.

BRASS DOOR RAIL, Polished.—52 cents per lb.—10 ⅌ discount.

BELT AND HOSE COPPER RIVETS AND BURS.

Price per ₤	57	58	60	62	64	66	68	72	76c.
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 51 cents per pound.

Copper and Brass Rivets and Burs made to particular sizes and pattern.

The discount on the foregoing list will be 10 per cent.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent. 12 inch. to No. 26	0·65	0·80
6 " " "	0·75	0·90
10 " " "	0·90	1·10
15 " " "	1·00	1·25
18 " " "	1·10	1·40
20 " " "	1·20	

German Silver Sheets over 12 inches wide and weighing more than 10 lbs. ... $2·60 ₩ ₤ the

Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.

All German Silver thinner than No. 36 is Platers' at 50 cents per pound additiona..

German Silver Scrap, one-third less than net price of 13 inch Market Metal; German Silver Turnings, Filings and Chips, half the price of Scrap.

*Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Guage.

COPPER—DUTY: Pig, Bar and Ingot, 5; old copper, 4 cents ₩ ₤; Manufactured (including all articles of which copper is a component of chief value), 45 ⅌ ad valorem. All subject to a reduction of 10 per cent.

American Ingot ... ₩ ₤ 35½ @ 35c
English " ... " 31 @ 32c

SHEATHING, BRAZIERS' COPPER, BOLTS, &C.
- Braziers Copper, ordinary sizes, over 16 oz., per square foot ... 45c. ₩ ₤
- Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot ... 48c. "
- Braziers' Copper, 12 oz. per square foot and lighter ... 51c. "
- Circles less than 84 inch in diameter ... 48c. "
- Circles, 84 inch diameter and over ... 51c. "
- Segment and Pattern Sheets ... 48c "
- Locomotive Fire Box Sheets ... 45c. "
- Sheathing Copper, over 12 oz. per sq. ft. ... 43c. "
- " 12 oz. ₩ sq. ft. & lighter. 51c. "
- Bolt Copper ... 45c. "

No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

TINNING.
- 14x48, by the case ... 8c. ₩ sheet.
- 14x48, less than case ... 10c. "
- Boiler Sizes, 7 and 8 inch ... 12c. "
- " 9 inch ... 15c. "
- Other sizes not larger than 30x60 ... 2½c. ₩ sq. ft.
- Larger than 30x60 ... 5c. " "
- Copper Bottoms, 48c ₩ ₤.; 5 ⅌ discount.

O'NEIL'S PATENT PLANISHED COPPER.

14x48.
- 14 and 16 oz. and heavier ... 49c. By the case, 48c. ₩ ₤
- 12 oz. and lighter ... 52c. " " 51c. "

Boiler Sizes.
- 7 in., 14x32. 8 in., 14x56, 9 in., 14x60.
- 14 and 16 oz. and heavier ... 51c. By the case, 50c. ₩ ₤. (And all sizes not over 20 inches wide).

30x60.
- 14 and 16 oz. and heavier ... 53c. ₩ ₤.
- 12 oz ... 56c. "

LEAD—DUTY: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.

Spanish	@	6¼c gold
German Refined	@	6¾c gold
English	@	7¼c gold
Bar ... dis 10 ⅌		9¼c
Pipe ... dis 10 ⅌		10½c
Tin Lined Pipe ... dis 10 ⅌		16½c
Sheet ... dis 10 ⅌		10½c
Shot ... dis 10 ⅌. Drop, 11½c; Back, 12¼c		

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 ⅌ ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	17c
Spring	13½c
Homogeneous	13½c
Tire	12½ @ 13½c
Machinery (round and square)	11½ @ 12c
File	12½
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
aw Plate, gang and X cut	13 @ 14
" circular as to size	18 @ 30c

Chrome Steel.

Tool	16 @ 18c
Machinery	11 @ 12c
File	12 @ 15c

English Steel—payable in gold, dis. 5 ⅌ cash.

do	Best Cast	₩ ₤	19½c
do	Extra Cast	"	20½c
do	Round Machinery, Cast.	"	12½c
do	Swaged, Cast	"	21½c
do	Best Double Shear	"	19½c
do	Blister, 1st quality	"	15½c
do	do 2d quality	"	13½c
do	do 3d quality	"	11½c
German Steel. Best		"	12½c
do	Eagle	"	11½c
do	3d quality	"	10½c
Sheet Cast Steel, 1st quality		"	19½c
do do	2d quality	"	17½c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	8c. gold
American "	8 @ 11c currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.: Electro-galvanized Plates, 2 cents per lb.; Manufacturers of, not enumerated, 35 per cent. ad val.—all subject to a reduction of 10 per cent. Bars, Banca or Block, and Pigs, fre

Banca	₩ ₤	37½c, gold
Straits	₩ ₤	@ 32c, gold
English	₩ ₤	@ 33c, gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal	@ 14·00
12x12, "	@ 14·50
14x20, "	@ 15·00
I X 10x14,	@ 16·25
12x12, "	@ 16·75
14x20 "	@ 17·25
For each additional X add	2·25 @ 2·50

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$13·50	$12·50	$12·00
14x20	14·25	13·00	
12x12	13·75	13·00	

TERNE PLATE.

	Prime. Charcoal.	2d qual. Charcoal.	Coke.
I C 14x20	$12·50 @ 13 00	12·25 @ 12·75	10·75 @ 12·25
I X 14x20	15·00		

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2¾ cents per pound. All subject to a reduction of 10 per cent.

Sheet	cask 10¾c
"	open 10¾ @ 11¾c

Paper Stock, Old Metals, &c

(*Dealers' Selling Prices.*)

Canvas linen	5¾ @ 6
Canvas, cotton, No. 1	7¼ @ 7½
" " No. 2	4
White linen rags, No. 1	7 @ 7¾
" " No. 2	5 @ 5¾
Colored	3 @ 3½
Mixed woolens	2 @ 3
Soft woolens	9
Gunny bagging	2¾ @ 3
Jute Butts	2 @ 2¾
Kentucky bagging	3½ @ 3¾
Book stock	4½ @ 5
Waste paper and scraps	2½ @ 3
Rope cuttings	1½ @ 3
Kentucky Bale rope	4 @ 4¼
Oakum junk, No. 1	5 @ 5¼
" " No. 2	4
Grass rope	4¼ @ 4¾
Tarred Shaking	1¾ @ 2

Old Metal.

Copper	27 @ 28
Yellow metal	18 @ 20
Brass	18 @ 21
Old lead, solid	6½ @ 7
Tea lead	5½
Wrought Iron	2¾
Sheet iron	1 @ 1¾
Cast iron	@ 1½
Machinery iron	1¾ @ 2
Zinc	@ 5¼
Pewter, No. 1	26 @ 27
" No. 2	19 @ 12
Spelter	7

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₩ ₤ 20
" " Ordinary	6c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil	kegs, 8c, asst'd cans, 10½c
Blue, Prussian, fair to best	30 @ 75c
" " in oil	35 @ 65c
" Chinese, dry	83c
" Ultamarine	25 @ 30c
Brown, Spanish	1¾c
" Van Dyke	4c
Carmine, French	$14 00
Green, Chrome	15 @ 25c
" in oil	18 @ 25c
" Paris	good, 20c, best, 40c
" in oil	" 30c, " 45c
Mineral Paints	1¼ to 4c
Orange Mineral	14½c
Red Lead, American	9¾c
" " English	10½c
" Venetian (N. C.) dry	3½c
" " in oil	asst'd cans, 11c, kegs, 8½c
" Indian, dry	10c
Rose Pink	13c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	16 @ 26c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 8c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	1 40
" English	1 30
" Trieste	1 05
" American, Common	28c
White Lead, American, pure dry	10¾c
" " " in oil	11½c
White, Paris, English, prime	in bbls. 2½ @ 2¾c
Yellow Ochre, French	2½ @ 2¾c
" " " in oil asst'd cans, 11c, kegs, 8½c	
" " Vermont	in casks 1¼c
" Chrome	17 @ 27c
" " in oil	18 @ 28c
Zinc White, American No. 1 dry scarce	10c
" " " 1, in oil	12c
" French (Paris)	11½c
" " in oil	12½c

Oils.

Linseed Raw	₩ gal. casks, 95c, bbls, 96c
" Boiled	" 1·00c, " 1·01
Whale, Crude	"
" Bleached Winter	"
Sperm, Crude	"
" Winter unbleached	"
" " Bleached	" 1 85
Seal, Extra Refined	" 87½c
Lard, Pure Winter	" 80c
" Spring	" 78c
Cotton Seed, Crude	" 55c
" Southern Yellow	" 65c
" White	" 75c
Neatsfoot, Winter	" $1 35
Natural Lubricating	" 45c

Sundries.

Asphaltum	8c
Benzine	₩ gal. 20c
Chalk	1½c
" Block	
Dryer, Patent, Am'n	asst'd cans, 11½c., kegs, 9c
" " English	" " 12c., " 11c
Flocks	
Frostings	50c
Glue, White	33 @ 45c
" Sheet	20c
Glazier's Points, Zinc	9c
Gum, Copal	36c
" Damar	25c
" Shellac, English	50c
" " " dark	46c
Litharge	10c
Pumice Stone, selected Lumps	5 @ 7c
" " powdered	4c
Putty in bladders	3½c
" in bulk	3c
Rotton Stone, soft, English	5c
Sand Paper, crystal	$3 25
" " flint	80
Spirits Turpentine	68c
Whiting, Spanish	1¼c

Glass.

French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$10·75	$9·75	$9·00	$8·25
11 x 14 & 12 x 13	11·50	10·25	9·75	8·75
10 x 16 to 14 x 26	12·50	11·50	10·25	9·00
18 x 22	13·25	12·00	10·75	9·50
15 x 26 to 20 x 30	15·75	14·00	12·00	10·25
22 x 30 to 24 x 30	19·75	16·75	13·50	
26 x 28 to 24 x 36	20·25	17·50	14·00	
26 x 36 to 26 x 44	22·75	20·25	15·50	
28 x 44 to 30 x 50	24·00	21·50	16·75	
30 x 52 to 30 x 54	27·25	24·00	18·75	
30 x 56 to 34 x 56	29·50	26·25	22·00	
34 x 58 to 34 x 60	31·50	29·50	25·00	
36 x 60 to 40 x 60	37·00	32·50	29·50	

DOUBLE

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$16·00	$14·50	$13·50	$12·50
11 x 14 & 12 x 13	17·25	15·50	14·75	13·25
10 x 16 to 14 x 26	18·75	17·25	15·50	13·50
18 x 22	20·00	18·00	16·25	14·25
15 x 26 to 20 x 30	24·00	21·00	18·00	15·50
22 x 30 to 24 x 30	30·00	25·25	20·25	
26 x 28 to 24 x 36	31·00	26·50	21·00	
26 x 36 to 26 x 44	34·00	30·50	23·25	
28 x 44 to 30 x 50	36·00	32·25	25·25	
30 x 52 to 30 x 54	41·00	36·00	28·25	
30 x 56 to 34 x 56	45·00	39·50	33·00	
34 x 58 to 34 x 60	48·00	45·00	37·50	
36 x 60 to 40 x 60	55·00	49·50	45·00	

Sizes above—$12 ₩ box extra for every five inches. Discount to the trade 50 per cent.

HILL'S ARCHIMEDEAN" LAWN MOWER.

THE CHAMPION OF THE WORLD.

he first and only Balanced Lawn Mower made and operated by an Adjustable Handle.

The leading Machine both in the United States and Europe, having taken the Gold Medal at the great Fair in Hamburg, Germany, and the Premiums at every test trial in the U. S. Also the Silver Medal at the Cincinnati Exposition of 1872.

So well known is this favorite Lawn Mower that it needs no further recommendation. It has a greater reputation, and larger sale, both in the United States and Europe, than any Lawn Mower made, and the first and only one constructed upon those principles.

What we claim for it over others is ease of operating, *durability*, and beauty and evenness of its work.

We wish more particularly to call attention to the addition we have made to our list, of 2 sizes of Horse Mowers, and one beautiful little Croquet Mower for small Lawns and Cemetery Lots, which is the most complete thing of its kind made, and is easily operated by a Miss of ten years. Our list is as follows:

10 inch Croquet Mower, for Miss, $20.00. 14 inch, for Man - - - - - $25.00.
12 inch, for Boy - - - - 22.00. 28 inch, for Pony - - - - - 100.00.
32 inch, for one Horse - - - $125.00.

Send for circulars. Manufactured by the

Hills Archimedean Lawn Mower Co.,
Colts Armory, Hartford, Conn.

SEMPLE, BIRGE & CO., General Agents, West of the Mississippi, St. Louis, Mo.

The Improved Excelsior Lawn Mowers,

FOR HAND OR HORSE POWER, MANUFACTURED BY

CHADBORN & COLDWELL MANUFACTURING CO.

P. O. Box 479, NEWBURGH, N. Y.

	Price.	Width of Cut.	Grass Box.	Horse Boots.
No. 2¾	$ 75	25 inch.	.....	$12 per set.
No. 3	125	30 "	$10	12 "
No. 4	160	35 "	11	12 "
No. 5	200	40 "	12	12 "

For Sale by all the leading Hardware, Agricultural Implement and Seed Stores, in this and foreign countries.

Ask for the Excelsior and get the Best.

No. 0 Hand Mower—Cuts 11 inches.....Price, $16.
No. 1 " — " 14 " ..... " $25.
No. 2 " — " 18 " ..... " $30.

The No. 1 for general use, and warranted. The No. 2 for large lawns—when smooth.

The Excelsior is simple and durable. The *gearing* securely incased and will not clog. Has a *ball roller*, without which no machine is perfect. A *ball ratchet*—"noiseless"—needs no oiling. Adjustable *wrought iron handle*. *Hangers* secured by bolts. The front rollers to these are adjustable, to vary the hight of cut. *Open balance wiper*—with *steel knives*—the only practicable means of securing strength and ease of draught. *Patent iron handle*, with attachment on each side of the machine—avoids the serious annoyance of a single wooden handle. The **Excelsior Lawn Mower** having been before the public for four years, and subjected to the most severe tests, the manufacturers feel warranted in asserting that for SUPERIORITY in *simplicity of construction* and *durability* it has no equal. It is *important* in either *Horse* or *Hand Lawn Mowers*, that their design should combine the *greatest strength* with least amount of *metal*; we therefore use only the very *best material*, together with *good workmanship*, enabling us to produce *Lawn Mowers* light *in weight*, of *easy draught*, and at a price within the reach of all.

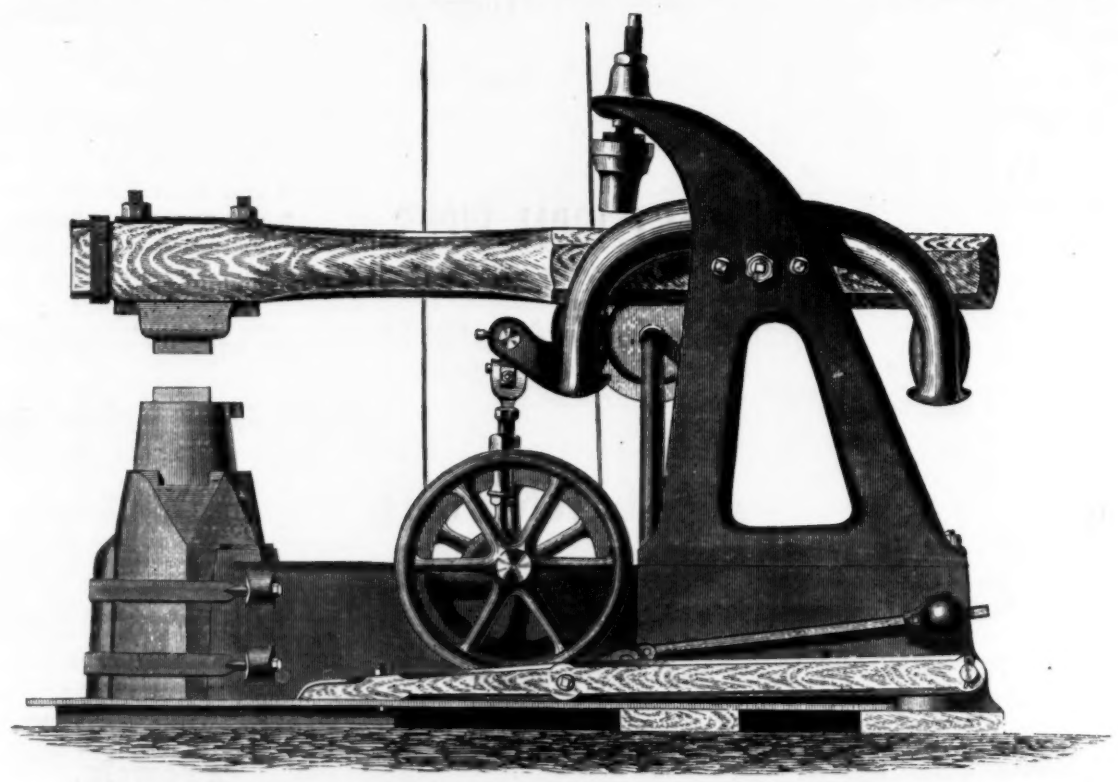
The Excelsior has received the most favorable commendation from all, and the advantages claimed for it over other machines are fully appreciated wherever it is known. To this we add numerous testimonials, but the fact that our sales have greatly increased year by year, is the most convincing proof of its adaptation to the wants of the public.

GRAND SILVER MEDALS AWARDED THE EXCELSIORS AT THE

New England Fair, held at Lowell, Mass., Sept., 1871 and 1872; New Jersey State Fair, held at Waverly, N. J., Sept., 1871 and 1872; the first premium at the New York State Fair, 1871; Western New York Fair, 1871; Ohio State Fair, 1871 and 1872; Northern Ohio Fair, 1871 and 1872; Michigan State Fair, 1871 and 1872; Indiana State Fair, 1871; Wisconsin State Fair, 1871 and 1872; Tennessee State Fair, 1871; Virginia State Fair, 1871; South Carolina State Fair, 1871.

For description of Mowers and particulars, send for catalogue. Agents wanted. A liberal discount to the trade.

BRADLEY'S CUSHIONED HAMMER.



This Hammer is a great improvement over the old style of helve hammers. It is all made of Iron and Steel except the helve and cushions. It is portable, takes up but little room, and makes no noise except the stroke of the hammer. It takes less power to drive it, and it turns out more and better work. The helve is nicely balanced upon two adjustable hardened steel centers, and there is no bind or friction connected with its action. It will endure more hardships at less expense for repairs, and, consequently, outlasts any other. Its capacity is greatly increased, but not at the expense of its size, convenience or durability It strikes a more accurate, forcible and elastic blow than any other hammer. It is being used and is peculiarly adapted for the exceeding difficult work of swedging cotton spindles; no other hammer has been able to do this work as perfectly and economically. It is the favorite of every hammersman; it promptly obeys his every touch, and he soon regards it as a thing of life. *We warrant them as recommended*, and refer you to the following parties now using them:

W. H. Haskell & Co., Pawtucket, R. I.
Cole Brothers, Pawtucket, R. I.
American File Co., Pawtucket, R. I.
Fales, Jenks & Son, Pawtucket, R. I.
Providence Tool Co., Providence, R. I.
Nicholson File Co., Providence, R. I.
Woonsocket Iron Foundry, Woonsocket, R. I.
For particulars address

John Berkenhead, Mansfield, Mass.
Steele & Condict, Jersey City, N.
Silsby Mfg. Co., Seneca Falls, N. Y
Cowing & Co., Seneca Falls, N. Y.
Rumsey & Co., Seneca Falls, N. Y.
Clapp, Fitch & Co., Auburn, N. Y.
Sweet, Barnes & Co., Syracuse, N. Y.

Warder, Mitchell & Co., Springfield, O.
Robert Doyle, Watseca, Ill.
Furst & Bradley Mfg. Co., Chicago, Ill.
Chicago Plow Co., Chicago, Ill.
Mark H. Richards, Pottstown, Pa.
Peters Bros. Mfg. Co., Marshall, Mich.
Studebaker Bros. Mfg. Co., South Bend, Ind.

BRADLEY MFG. CO., Syracuse, N. Y.

SEND TO THE

FOR SAMPLE CARDS.

Our Paint is made of the very best material known to painters, viz: White Lead, Zinc and Linseed Oil, chemically combined, and is superior to any paint known to the trade. The advantages being that

It is ready for use.
It is applied with less labor.
It shows a beautiful enamel surface.
It does not chalk or peel off.
It does not run from nail holes or corners.
It is fire proof and water proof.
It covers old work as well as new.
It is the best paint for iron buildings.
It is equal to any for covering brick.
It is a perfect wood preservative.
Rain, before dry, does not wash it.
It is durable, retaining its enamel and freshness.

☞ Sold by the Gallon only, in Cans or Barrels.

Office, 43 Chambers St., N. Y.

Cornell Lead Co.,

Cor. Delaware and Virginia Streets. BUFFALO, N.Y

TRADE MARK.

Manufacturers

WHITE LEAD Dry and in Oil,

Lead Pipe, Sheet and Bar Lead.

S. G. CORNELL, Prest. A. P. THOMPSON, Vice-Prest.
S. DOUGLAS CORNELL, Secy.

White Lead, &c.

Union White Lead Mfg. Company,
26 Burling Slip, New York.,
B. W. How, Secretary. James How, President.
MANUFACTURERS OF
White Lead, Red Lead, Litharge, Orange Mineral.

Brooklyn White Lead Co.

TRADE MARK.

White Lead, Red Lead and Litharge.

89 Maiden Lane, NEW YORK.
FISHER HOWE, Treas.

JOHN JEWETT & SONS

Manufacturers of the well known Brand of

WHITE LEAD.

TRADE MARK.

Also Manufacturers of

LINSEED OIL
AND FLOOR OIL CLOTHS,
182 Front Street, NEW YORK.

TRADE MARK.

The Atlantic White Lead and Linseed Oil Company,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead Litharge & Linseed Oil.

ROBERT COLGATE & CO.,
287 Pearl Street, New York

John T. Lewis & Bros.,

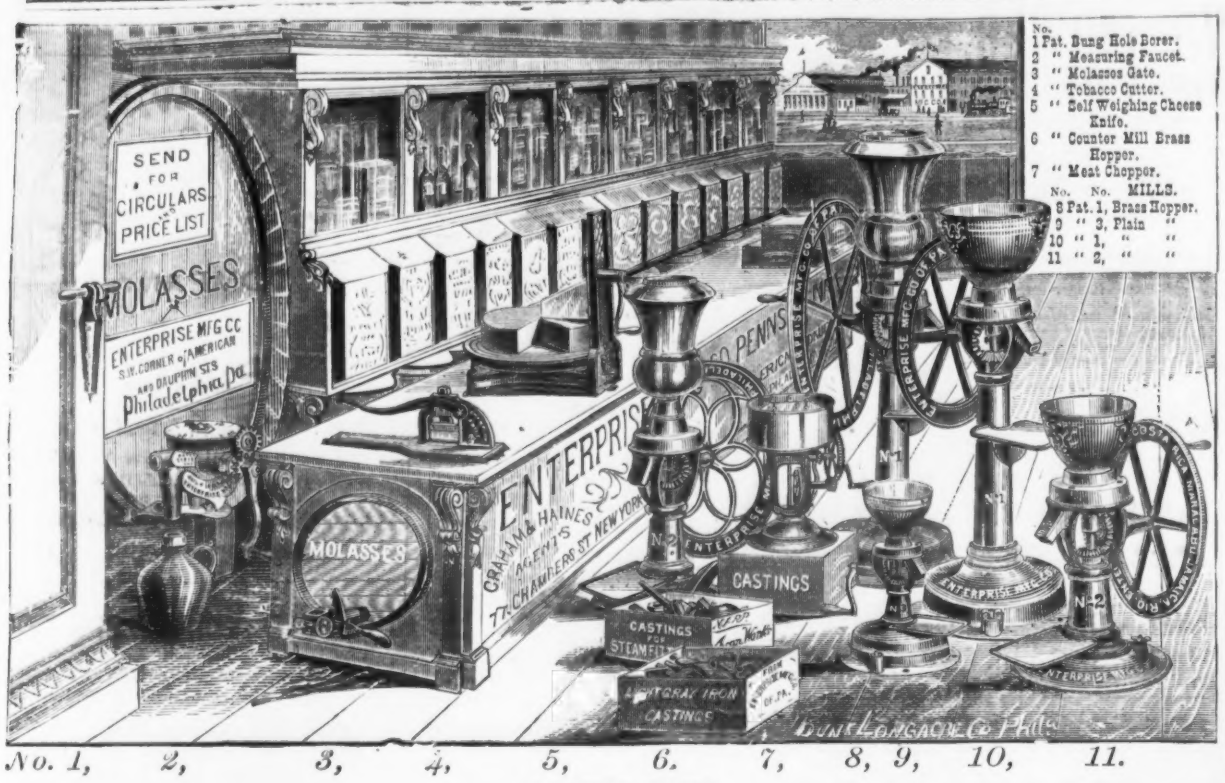
No. 231 South Front St.,
PHILADELPHIA.

TRADE MARK.

MANUFACTURERS OF

PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil

AND PAINTERS' COLORS.



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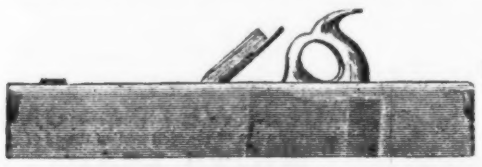
W. Cor. of American and Dauphin Sts., PHILADELPHIA.

SANDUSKY TOOL CO.,

MANUFACTURERS OF

Planes, Plane Irons, Carpenters', Cabinet Makers' and Coopers' Tools,



Bench, Hand and Tail Screws, and Chisel, File and Auger Handles.

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Headquarters for

Henry Disston & Sons' Saws,

Hand, Mill, Circular and Cross Cut.

ALSO,

Plumbs and Levels, Try Squares, Gauges, Trowels and Barker's Reversible Butt.

A full assortment constantly on hand. Address orders to

GRAHAM & HAINES, 88 Chambers Street, N. Y.

Samuel Loring's Tacks and Rivets.

Warehouse, 88 Chambers Street, New York.

A full assortment of

TACKS (all kinds), BRADS, TRUNK, CLOUT, HUNGARIAN and FINISHING NAILS.

Also, BLACK and TINNED RIVETS always on hand for immediate delivery, if required.

GRAHAM & HAINES, 88 Chambers Street, New York, Agents.

Philadelphia Tool Co.,

MANUFACTURERS OF

Davis' Patent Duplex Wrench,

A tool well made of **Best Materials**, combining all the good qualities of a regular Nu Wrench of equal size with that of at least six pairs of Pipe Tongs. For circulars and price lists, address,

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Manufacturers of

Galvanized and Japanned Sheet Iron Goods and Tin Ware.

Coal Hods. Patent Stamped Corrugated Riveted Bottom.
Fry Pans. "Excelsior" Polished.
Excelsior Broiler. Best and Cheapest in the market.
Combined Chamber and Commode Pail,
Ash Cans, Galvanized and Japanned,
Galvanized Water Pails, Well Buckets,
Chamber Pails, Tea Kettles, &c., &c.
Toilet Sets. Fancy and Grained.
Chamber Pails, Slop Pails, Foot Tubs, Baths, Water Carriers, Coolers, &c., &c.
Stamped and Piece Dish Pans and Plain Tin Ware.

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Patent Family Glue Pot.

The Pot and Cup are made of Cast Iron, like the ordinary Glue Pot, with a cover and serviceable brush. It is altogether the best of the cheap Glue Pots in the market, being in everything except size exactly the same as those used by mechanics. From the large sales in the past, we are convinced that it supplies a necessity long felt where Glue is required—in the family, store, bank and office. The Glue is prepared in a manner to prevent all decay or mould. It is always ready for use, and will save many dollars. They are packed half a dozen in a box, and twelve boxes in a case. Price, per doz. $5, with a liberal discount to the trade.

Orders should be addressed to the manufacturers

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BUY ONLY THE

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Standard Scales.

Stock Scales, Coal Scales, Hay Scales, Dairy Scales, Counter Scales, &c.
Scales repaired Promptly and Reasonably.
For sale, also, Troemner's Coffee and Drug Mills, Composition Bells, all sizes Letter Presses, &c., &c.

THE MOST PERFECT

ALARM CASH DRAWER.

MILES ALARM TILL CO.'S

EVERY MERCHANT SHOULD Use them.

EVERY DRAWER Warranted.

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For sale by leading Hardware Dealers.

WM. P. KELLOGG & CO.,

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Best Made and Best Finish

Curry Combs,
Boring Machines,
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COOLEY'S PATENT WHIP RACK.

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Pipe, Fittings, &c.

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For STEAM, WATER and GAS.

Wrought Iron Pipe & Fittings, Plain and Galvanized

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FITTINGS, BRASS & IRON VALVES & COCKS
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PIPE CUT & FITTED TO PLANS FOR MILLS &c.
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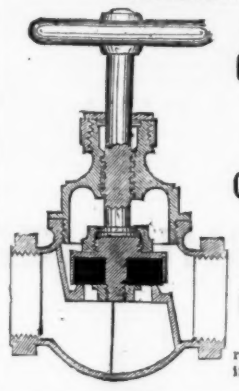

Jenkins' Patent **Compression Valves** AND **Gauge Cocks**

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Warranted the most reliable and durable in the country.

CAST IRON PIPES

FOR WATER AND GAS.

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PHILLIPSBURG, NEW JERSEY.

EATON & COLE.

Manufacturers of

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BRASS VALVES, COCKS, TOOLS, &C.,

Sole Agency for the East.

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GRAFF TUBE WORKS.

WILLIAM GRAFF & CO.,

Manufacturers of Plain and Galvanized

Wrought Iron Pipe

For

Gas, Steam, Water, Oil, &c.,

No. 140 First Ave., PITTSBURGH, PA.

Pipe of any Size, Length or Thickness furnished to order.

Chas. Gregg Stearns, Pres. A. F. Weaver, Treas.
Geo. Watson, Sec.

THE CHARLES GREGG MANUFACTURING CO.

FITTINGS FOR

Steam, Gas and Water,

PLAIN AND GALVANIZED

WROUGHT IRON PIPE,

Nos. 62 & 64 Gold Street,
NEW YORK.

Business Established, 1836. Incorporated. 1872

Industrial Tube Works.

ISAAC J. GRIFFITHS & BROS.

Manufacturers of

Wrought Iron & Galvanized Tubes

For Gas, Steam and Water.

Brass and Iron Valves, Cocks,

Cast and Malleable Iron Fittings.

Tubes cut and fitted to plans and specifications.

1529, 1531, 1533 & 1535 South 7th St.,
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WM. S. CARR & CO.

Sole Manufacturers of

Carr's Patent Plumbers' Goods,

Pumps, Water Closets, Fountains, Vases, &c.

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WEST PHILADELPHIA,

Manufacturers of

Plasterers' and Brick Trowels,

Hammers and Chisels.

ALSO,

Saddlers' Round Knives, etc.,

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Mechanical work a Specialty.

PHILADELPHIA.

(Corrected weekly by Loyd, Supplee & Walton.)

Terms, 30 days. For 60 or 90 days' interest added at 10 per cent. per annum.

ANVILS.
Solid Cast Steel ... ℘ ℔ 12½c
Peter Wright's ... ℘ ℔, gold, 12½c
Wilkinson's ... 11½c
Eagle, ℘ ℔ 11 cents, currency ... dis 15%

APPLE PARERS.
Reading / Turn Table ... per doz $8 50
Union ... per doz 8 00

AXES.
Mann's Light ... Per doz. $13 00 @ 14 00
Hunt's, Light ... $14 00 @ 14 50
Red Indian, all sizes ... $13 00 @ 13 50
Red Chieftian " ... $13 50 @ 14 00
Crown Prince ... $14 00 @ 14 50

AUGERS AND AUGER BITS.
Pierce's Patent Twist Bits ... dis 20 @ 20&5%
Bates' & Ives' Bits ... dis 20&10%
Douglass' Bits ... dis 30%
Cook's Bits ... dis 25&10%
Bonney's Pat. Hollow Augers ... dis 25%
Russell Jennings' Bits ... dis 10%
Bates' & Ives' Nut Augers ... dis 20&10%
Douglas Nut Augers ... dis 30%
Watrous' Ship Augers ... dis 10%

BALANCES.
Landers, Frary & Clark's ... dis 10 @ 15%
Chatillon's ... dis 10 @ 15%
Morton's ... dis 10 @ 15%
Common Spring, with Hook ... ℘ doz $1 38 @ 2 00

BELLS.
Bevin Bros. Mfg. Co. Hand Bells ... dis 50%
Extra Light Hand Bells ... dis 50&10%
Other makers, light ... dis 50&10%
Connell's Door Bells ... old list net
Western and Kentucky ... dis 50%

BORING MACHINES.
Bates' Mfg. Co., complete with augers ... dis 10 @ 15%
Douglas' " " " ... dis 10 @ 15%
Common No. Augers ... $4 25 @ 4 00
Angular, Extra, No. Auger ... 5 50 @ 5 00

BOLTS.
Eastern Carriage Bolts ... dis 60&10%
Western " " ... dis 60&10%
Philadelphia Carriage Bolts ... dis 40%
Wrought Shutter Bolts ... dis 35&10%
Cast " " ... dis 35%

BRACES.
Barber's ... dis 30&10 @ 40%
Bartholomew's ... dis 10 @ 15%
Spoffard ... dis 37½%

BUTTS.
Cast Fast Joint, Narrow ... dis 15%
" " Broad ... dis 30%
Cast Loose Joint ... dis 40%
" Acorn Drilled ... dis 25&10%
Wrought Loose Pin ... dis 20%
" Table & Back Flaps ... dis 5%
" Narrow ... dis 10%
" Loose Joint ... dis 25%
Parker's Blind Butts ... dis 30%
Shepard's " " ... dis 30%
Clark's " " ... dis 30%
Lull & Porter's " ... dis 25 @ 25&5%
Palmer's " ... dis 30 @ 30&5%
Garretsons' " ... dis 40%

CHAINS
German Halter, ... new gold list @ dis 10%
" Coil ... new gold list @ dis 10%
Galvanized Pump ... ℘ ℔ 15c
English Coil, less than cask ... add ½c. ℘ ℔
Common Chain, ... ½c. ℘ lb less.
Best Proof Coil Chain—

℘ ℔ ...	14½	11½	10½	10	9½	9½	9s gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 560 lbs., discount ½c per lb. Common Chain, ½c per lb. less than proof.

CHISELS.
Socket Framing ... dis 60 @ 60&5%
Socket Firmer ... dis 60 @ 60&5%
Tang Firmer ... dis 40 @ 40&5%
Beaty's Framing and Firmer ... dis 10 @ 10&5%

CASTERS.
Porcelain Wheel ... dis 20 @ 20&5%
Iron ... dis 20 @ 20&5%
Brass ... dis 20 @ 20&5%

CLOTHES WRINGERS.
Reliance advanced March 7 ... per doz $72 00
Crown " " 7 ... " " 72 00
Monitor " " 7 ... " " 72 00
Universal " " 7 ... " " 72 00
Novelty " " 7 ... " " 72 00
In 5 dozen lots assorted, at one time $70 00 per doz.

COFFEE MILLS.
Common Box and Side advanced April 1872 ... dis 15%
Patent " " " " ... dis 10%

CUTLERY.
American Pocket (best) ... dis 20 @ 25%
Landers, Frary & Clark, J. Russell & Co., and Lamson & Goodnow Mfg. Co. Manufacturers' net prices

DRAWING KNIVES.
Hart Mfg. Co.'s ... dis 60 @ 60&5%
Concave Adjustable Handle ... dis 10%
Beatly ... dis 10%

FILES.
Nicholson Mill Files ... new list, $5 00 to £ cur
" Bastard ... " " 5 00 to £ cur
" Taper ... " " 5 00 to £ cur
Butcher's Mill ... 5 75 to £ gold
" Bastard ... 5 50 to £ gold
" Taper ... 5 50 to £ gold

FLUTING MACHINES.
Royal, No. 1, 4½ inch Rollers ... list $6 00
" No. 2, 6 inch Rollers ... list 7 00

HAMMERS AND HATCHETS.
Yerkes & Plumb's ... dis 5 @ 10%
Hammond & Son's ... dis 5 @ 10%

HINGES.
Strap and T ... dis 15%
Bonney's No. 1 Gate ... dis 25%
" No. 2 & 3 ... dis 35%

HORSE NAILS.

	Nos. 6	7	8	9	10
Ausable Horse Nails	27	25	24	23	22
Globe " "	29	26	25	24	23
Brundage " "	26	24	23	22	21

	Nos. 5	6	7	8	9	10
Putnam " "	32	28	26	25	24	23

On Ausable Globe & Brundage 1000 ℔ lots ... dis 5%

KNOBS.
Door (regular manufacture) ... dis 25%
Porcelain and Mineral ... dis 25%

LOCKS AND LATCHES.
Rim and Mortise ... dis 25%
Till and Cupboard ... dis 20 @ 25%
American Padlocks ... dis 40%
Trunk Locks ... dis 5 @ 10%
Thumb and Roggens Latches ... net @ dis 10%

MATTOCKS.
Long and Short Cutter ... dis 10%
Western Pattern ... dis 10%
Pennsylvania Pattern ... dis 10%

MOLASSES GATES.
Enterprise Mfg. Co.'s Measuring Faucets ... dis 20%
Stebbins' Gates ... dis 50 @ 50&10%
Lincoln's " ... dis 40 @ 40&10%
Landers, Frary & Clark's, Petroleum dis 10 @ 10&10%
Taylor's Petroleum Faucets ... dis 20 @ 20&10%

RAKES.
Cast Steel Garden ... dis 30%
Malleable " ... dis 33⅓%
Wood Head Iron Teeth ... dis 30 @ 40%

RULES.
Stanley Rule and Level Co. / Stevens and Hubbard's ... dis 50 @ 50&10%

SQUARES.
Steel Squares, new list ... dis 50%
Iron " " " ... dis 50%

SAWS.
Disston's Cross Cut ... dis 12½%
Disston's Hand ... dis 7½%
Wm. McNiece's Hand, Cross-Cut and Circular, new list ... dis 10%
Boynton's Lightning, new list ... dis 30%

SHOVELS AND SPADES.
Rowland's Plain Back, list Feb. 1873 ... dis 20%
" Back Strap " " " ... dis 20%
Oliver Ames & Sons, advanced April 8 ... net list
Brady Shovel Co. ... dis 7½%

SAD IRONS.
Reading (planed face) ... per lb. 5½c.
Coquanock (polished face) ... " 5c.

STOVE POLISH.
Gem ... per gross $5·00
Onyx ... " $5·00

SCYTHES.
Golden Clipper ... ℘ doz $11 50
Clipper No. 10 ... " 10 50
Common Scythes ... ℘ doz $7 00 @ 10 00

SCREWS.
Iron (list Mar 6) ... dis 50%
Brass (Brass Screw list) ... dis 40%

SPOONS.
Plated Spoons, Rogers Bros.' ... dis 25 @ 25&5%
Britannia, Parker's and Boardman's dis 25 @ 25&10%
German Silver ... list net
" " Light ... dis 5%

TRY SQUARES.
Stanley Rule & Level Co. ... dis 40%
Diston's ... dis 12½%

TACKS, CLOUT AND FINISHING NAILS.
Half Weight Tacks ... dis 70%
" " by case ... dis 70&7½%
Clout and Finishing Nails ... 7½%
" " by the case ... dis 7½%

TRAPS.
Genuine Oneida—Newhouse list ... dis 20%
Imitation " " " ... dis 20&10%

WRENCHES.
Coes Genuine ... dis 30%
Coes Imitation Wrought Bar ... dis 40%
" " Malleable Bar ... dis 50%
" Pattern Malleable Bar ... dis 50%
Tafts Wrought Bar ... 60%
Tafts Malleable Bar ... 65%

WIRE.
No. 0 to 18 ... dis 20 @ 22½%
No. 19 to 26 ... dis 27½ @ 30%
No. 27 to 36 ... dis 33⅓ @ 35%
Coppered 0 to 12 ... dis 15 @ 20%
Tinned Broom Wire ... dis 15%

Bradlee & Co., Office Nos. 19 & 21 South Fourth st., Philadelphia. Price list of Proved and Warranted Chains. Discount ¾c. per ℔.

SHORT LINK CHAIN.

Size. Inches.	Average Wt. Per Fathom. Lbs.	Proof. Tons.	Price Cts. Per Lb.
⅜	15	4	10½
9-16	19	5	10
5-8	25	6	9½
11-16	30	8	9·3
¾	35	10	8¾
13-16	40	12	8⅝
⅞	47	14	8½
15-16	54	16	8⅜
1	60	18	8¼
1 1-16	67	20	8⅛
1⅛	74	23	8
1 3-16	82	26	7⅞
1¼	90	28	7¾

All larger sizes same price as 1¼ inch.
Stud Chain 2½c. less than same size close link.

PITTSBURGH.

From the Pittsburgh Commercial.

FLAT BAR.
1½ to 4 by ⅜ to 1 inch ... 4·6c
4½ to 6 by ⅜ to 1 inch ... 4·8c
1¼ to 6 by 1⅛ to 1½ inch ... 5·0c
1¼ and 1⅜ by ⅜ to ⅝ inch ... 4·8c
1 and 1⅛ by ⅜ to ⅝ inch ... 4·9c
⅝, ¾ and ⅞ by ⅜ to ⅝ ... 5·0c

HORSE SHOE.
All sizes ... 6·1c
Nail rods ... 8·5c

HEAVY BANDS.
3½ to 6 by ¼ and 5-16 inch ... 5·2c
1½ to 3¼ by ¼ and 5-16 inch ... 5·3c
⅞ to 1⅛ by ¼ and 5-16 inch ... 5·6c
⅝ to ¾ by ¼ and 5-16 inch ... 5·8c

LIGHT BANDS.
3 to 6 by 3-16 to No. 12 ... 5·6c
1½ to 2¾ by 3-16 to No. 12 ... 5·8c
1 to 1⅜ by 3-16 to No. 12 ... 6·2c
⅝ to ⅞ by 3-16 to No. 12 ... 6·8c

HOOPS.
2½ to 3 inch ... 5·9c
3½ to 4½ inch ... 6·1c
1¾ to 2 inch ... 6·1c
1⅝ to 1 11-16 inch ... 6·4c
1½ and 1¼ inch ... 6·7c
1 inch ... 7·1c
⅞ inch ... 7·6c
¾ inch ... 8·1c
⅝ inch ... 8·6c
½ inch ... 9·1c

ROUND AND SQUARE.
1 to 1⅞ inch ... 4·6c
2 to 2¾ inch ... 4·9c
3 to 3½ inch ... 5·1c
3¾ to 4 inch ... 5·6c
⅝ to 9-16 inch ... 5·0c
⅜ to 7-16 inch ... 5·3c
⅜ inch ... 5·4c
5-16 inch ... 5·8c
¼ inch ... 6·2c
3-16 inch ... 8·2c

OVAL IRON.
⅞ to 1½ inch ... 5·2c
⅝ to ¾ inch ... 5·4c
½ inch ... 5·6c
⅜ inch ... 6·2c

HALF OVAL AND HALF ROUND.
⅞ to 1½ inch ... 5·5c
⅝ to ¾ inch ... 6·0c
½ inch ... 6·7c
⅜ inch ... 8·2c

	Boiled.	Charc'l.	Juniata.
Sheet Iron, 10 to 14	6·2	7·7	9·2
" " 15 to 20	6·4	7·9	9·4
" " 21 to 24	6·6	8·1	9·6
" " 25 to 26	6·8	8·3	9·8
" " 27	7·0	8·5	10·0

All ... ects over 28 in. wide, ½c. ℘ ℔ extra.

TANK IRON.
3-16, ¼ and ⅜ inches thick ... 6·0
Boiler Plate Iron ... 7·9
Heads not flanging ... 7·1
Heads flanging ... 8·9
Plow Slabs ... 6·8
Plow Wings ... 7·3

RAILROAD IRON—COUNTERSUNK AND PUNCHED.
1¼ by ⅜, 7-16 and ½ inch ... 5·6
1½ by ¼ and 5-16 inch ... 6·1
1¾, 1⅞ and 2 by ⅜ and ⅝ inch ... 5·1
1½ by ⅜ inch ... 5·3

EXTRAS FOR CUTTING TO LENGTH.
Flat bars and rounds and squares ... 1c
Flat bars for tire ... 1c
Heavy bands ... 3c
Light bands and wagon box iron ... 4c
Hoops ... 5cc

TERMS.
Note or acceptance at sixty days, with currant rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within fifteen days of date of invoice. Payment to be made in New Bork exchange, United States Treasury notes, or their equivalent. No discount on bills of less than $50.

Heavy Hardware.

The following are the card rates of Lewis, Oliver & Phillips:

Iron, standard list, assorted sizes, for large orders, 4·6c, card rate, 2% off net.
Iron wedges ... 6½c ℘ ℔ net
Norway Nail rods ... 9½c ℘ ℔ net
Fence Pickets—
⅝ round, bent to shape ... 85c ℘ ft. fence, less 5% Discount off Standard List.
Carriage and tire bolts, ... 60% & 10%
Plow bolts ... 20% off net
Stove bolts ... list net
Machine and square head bolts new list ... 20% off net
Coach and lag screws, new list ... 20% off net
Bolt Ends, new list ... 20% off net
Square and hexagon nuts and washers, new list ... 4c ℘ ℔ off net
Washers ... new list, 4c ℘ ℔ off
1c. ℘ ℔ extra for less than 1 keg of each size.
Harrow teeth, in lots of 1 ton or more, 1 in. diam 5½c; ¾ & ⅞ in. diam. 5½c; ⅝ in. diam. 5½c ℘ ℔.
Patent Headed Harrow Teeth, packed in casks ½c extra ℘ ℔ net.
Skein bolts, in bulk, in lots of 1 keg or more, ⅝in. diam. 9c; 9-16 in. diam. 10c; ½ in. diam. 11c. 1c. ℘ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinge, ⅝ to 1in. diam. 10½c; ⅝ in. diam. 11½c; ½ in. diam. 13½c ℘ ℔, net.
Screw and Strap Hinges, in lots of 50 pairs or more, 14 to 36 in. long, 7½c; 8, 10 and 12 in. long, 9c ℘ ℔ net.
Strap and T Hinges ... 15% net
6 months purchases over $1000, 5% dis. allowed.
Screw hitching rings ... $7 ℘ 100 net
Duck nest tuyere irons ... $16 50 ℘ doz. net
Cast iron washers ... 5c ℘ ℔ net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 feet long ... ℘ ℔ 5½c
1 to 2 in. diam. from 4 to 8 feet long ... 6½c
1 to 2 in. diam., from 1½ to 4 feet long ... 6½c
⅝, ¾ and ⅞ in diam., over 4 feet long ... 7c
⅝, ¾ & ⅞ in diam., from 1½ to 4 feet long ... 7½c

WAGON HARDWARE.
Wagon Box Strap Bolts—
10 in. long by 7-16 at screw end, ℘ set of 8 bolts ... 55c
12 " ⅜ " ℘ " 8 " ... 70c
12 " ½ " ℘ " 8 " $1 00
14 " ½ " ℘ " 8 " 1 10
16 " ½ " ℘ " 8 " 1 20
5 cts. ℘ set for each additional inch over 14 inch, by ⅝. All lengths made.
Wag... Box Rods, narrow track each ... 18c
W... on Box Rods, wide track, each ... 20c
...ingle Tree Irons, per set of four pieces ... 38c
Wt. Iron Bolster Plates, 2½ in. wide, per set ... 60c
" " 3 " ... 65c
" " 3½ " ... 70c
" " 3⅝ " ... 75c
Wagon Brake Ratchets ... 16½c each
" " finished with guard 45c each
Wrought rub irons ... 11c each
Wrought Hammer Straps, heavy pattern ... 16c each
" " " light pattern ... 13½c each
Stay Chain Hooks ... 8c each
" " " heavy ... each 12c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 set ... 20% dis.
Wagon Box Staples, 1½ to 2½ in. to clinch per 1000, $14 00 net
Wagon Box Staples, Box Iron, to rivet on, per 1000, $11 00 net
Neck Yoke Eyes, each ... 5¾c net
Neck Yoke Eyes, with ⅜ inch rings ... 8½c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam. ℘ ℔ ... 5½c
Wagon Rivets, ex. large, oval and steeple head, ⅜ in. diam., all lengths, ℘ ℔ ... 11c
Wagon Rivet, 3-16 inch diam., all lengths ... 13c
Wagon Rivets & nails in 5 ℔ paper boxes, ℘ ℔ ex 1c
Wagon and Hinge Nails, ℘ ℔ net ... 17c
Coupling Plates / Double Tree Plates / Tongue Plates ... 9½c ℘ ℔ net
Neck Yoke Plates ... ℘ ℔ 12c
Tongue Cap Iron, 1¾, 2 and 2¼ in. wide, same price ℘ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue 5-16 in., 12½c; ⅜ in., 14c.

Nails, Brads, Spikes, etc,

CUT NAIL LIST.
10d to 60d nails, fence, and brads ... $5 50
8d and 9d nails, fence and brads ... 5 75
6d and 7d nails, fence and brads ... 6 00
4d and 5d nails, fence and brads ... 6 25
3d nails, fence and brads ... 7 00
2d nails, fence and brads ... 8 25

TOBACCO.

FINE BLUED.
3d ... $8 25
2d ... 9 25

LINING.
7-8 ... 10 00

CASING.
10d to 50d ... 6 25
8d ... 6 50
6d ... 6 75
4d ... 7 00

BARREL.
1⅛ inch ... $6 25
1⅜ inch ... 6 50
1¼ inch ... 7 00
1⅛ inch ... 7 25
1 inch ... 8 00
⅞ inch ... 8 50

FINISHING.
10d to 50d ... 6 75
8d ... 7 00
6d ... 7 25
4d ... 7 50

Cut spikes, all sizes ... 5 75
Cut boat spikes ... 6 25
Clinch nails, all sizes ... 6 25

TERMS.—Sixty day's time, or two per cent. discount if remitted within ten days from date of invoice. Prices subject to changes in market without further notice.

LENGTH OF NAILS.
2d, 1 inch; 3d, 1¼ inch; 4d, 1½ inch; 5d, 1¾ inch; 6d, 2 inch; 7d, 2¼ inch; 8d, 2½ inch; 9d, 2¾ inch; 10d, 3 inch; 12d, 3¼ inch; 16d, 3½ inch; 20d, 4 inch; 30d, 4½ inch; 40d, 5 inch; 50d, 5½ inch; 60d, 6 inch.

BOSTON.

Corrected by Fuller, Dana ... &c., 110 North St., Boston, Importers and Commission Merchants.

Tin Plates.
I. C. Charcoal ... per box @ 13 50
" Coke ... " @ 12 50
" Terne ... " @ 12 50

Metals.
Pig Tin, Banca, gold ... per lb. 37½c
" Straits, " ... 32c
" English, " ... 32c
Copper, Sheathing ... " 43c
" " yellow ... " 33c
Copper Bolt ... " 45c
" Braziers ... " 45c
" Ingot ... " 37c
" Old ... "
Lead, Spanish Pig, gold ... " 6¾c
" Sheet and Pipe ... " 9·45c
" Old ... " 6½c
Spelter, Silesian, gold ... " 7½c
" American, " ... " 6½c
Zinc, Sheet ... " 10½c

Iron.
Sheet Iron, Russia, gold ... per lb. 18c
" English ... " 7c @ 7½c
" American ... " 8c
" Galvanized ... " 11c @ 13c
Swedes Bar Iron, Flat, gold, per ton, $145 00 @ $155 00
" Shoe Shapes, " " 160 00 @
Norway Bar Iron, Flats, " " 145 00 @ 155 00
Norway Shapes, gold, per ton, 160 00 @
Norway R'd, 2 in. to ⅝ in. gld. pr. ton 150 00 @
" " 11-16 to ⅜ in. " 167 50 @
" " 5-16 to ¼ in. " 170 00 @
" Nail Rods, Roll'd " 187 50 @
" " U B. " 175 00 @
" " Benzon " 170 00 @
" " Vasa, " 165 00 @
" " N I W " 162 50 @
English Refined Bar Iron, " 105 00 @
Scotch Pig Iron, " 58 00 @ 62 50
American " " 45 00 @ 54 00
Wrought Scrap Iron, " 57 50 @ 60 00

Steel.
English Tool Steel, gold ... per lb. 16c.
" Machinery Steel, gold ... " 10c.
American Tool " ... " 16c.
" Machinery " ... " 11c.
Bessemer Steel ... 8½ @ 9½c
German " ... per lb. 10½c.
Spring Steel ... " 9c.
Tire " ... " 8c.
Sleigh Shoe Steel ... " 6½c.
Toe Calk " ... " 8½c.

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

March 8, 1873.

Axes, Chopping—Blood's ... $12 50 @ 14 50
Augers—C. S. cut ... dis 30%
Bits, Auger—Pierce's ... 25%
Jennings' ... dis 10%
Bells, Cow—Yaw's Genuine ... 20%
Bells, Hand ... dis 50&10 @ 55&10%
Bellows—Smiths' ... dis 15 @ 20%
Moulders' ... dis 10%
Bolts—Carriage and Tire, dia. neck ... dis 60 & 10%
Braces, Bit—Barber's ... dis 30 & 10%
Spofford's Patent ... dis 37½%
Brads, Cut ... dis 50&7½%
Boards—Stove, Brooks' Patent, new list ... dis 30%
Buckets—Well ... per doz $6 00
Butts—Brass ... dis 25%
Cast Loose Joint ... dis 40%
" " Pin ... dis 30
" " " Japanned ... dis 30%
" " " Silver Tipped ... dis 20%
Wrought Narrow ... dis 10%
" Broad, Loose Joint ... dis 15%
" Table and Back Flaps ... net
Belting—Rubber ... dis 30 @ 33⅓%
Leather, new list ... dis 30 @ 30 & 5%
Beaters, Egg, "Peerless" ... per doz $4 00 @ 4 50
Brick—Bath (box of 2 doz) Best English ... $1·50
"Rutherford" ... $1 25
Bung Borers—"Enterprise" ... dis 10&10%
Chalk—White, Carpenter's ... per gross, 50c
Red, Carpenter's ... " " 75c
Blue, Carpenter's ... " " 85c
Crayon School ... " " 14c
Chisels—Firmer Socket ... dis 50&20 @ 50, 20&5%
Framing Socket ... dis 50&20 @ 50, 20&5%
Corner Socket ... dis 50&20 @ 50, 20&5%
Slick's Carpenters' ... dis 50&20 @ 50, 20&5%
Castings—Malleable ... ℘ ℔, 10½c
Cutters, Meat—Hale's Patent ... dis 10%
Cherry Seeders ... per doz $9 00

Elbows—Corrugated	5	5½	6	7	
Charcoal	$4·25	5·25	5·25	6·50	dis 10%
Russia	10·00	13·00	13·00	14·00	

Faucets—Wood, Cork Lined ... dis 50 @ 50&10%
Files—Wheeler, Madden & Clemson's ... dis 42½%
Freezers, Ice Cream—"Champion" ... dis 33⅓%
Gates—Molasses—
Patent Self-Measuring ... ℘ doz. $43 00; dis 10&10%
Hinges—Window Blind— ... dis 30%
Shepard's St... ndard, and Clark's ... dis 30%
Wrought St... p and T ... dis 15%
Hods, Coal—P... n, Black and Galvanized. new list net
Funnel, Black and Galvanized ... new list net
Fancy and Helmet ... new list net
Hammers—Maydole's ... net
Yerkes & Plumb's ... dis 5 @ 10%
Hatchets—Blood's ... net @ 5%
Hooks and Staples—Wrought ... 50&10 @ 60%
Hooks—Belt ... dis 45&10%
Hasps and Staples—Wrought ... dis 50&10 @ 60%
Planes, Bench ... dis 15%
Sad Irons ... ℘ ℔ 5½c
Kettles—Brass ... ℘ ℔, 52½c
Enameled ... dis 30%
Knives, Drawing—Oval No. 1. dis 50&20 @ 50, 20&5%
Razor Blade ... dis 37½&20 @ 37½, 20&5%

Lanterns "Peerless". No. 1 5 10
℘ doz $26 00 $12 50 $15 00 dis 10%
"Radiant" 75 100 150 175
℘ doz $13·13 13·13 22·50 22·50 dis 20%
Knobs—Door ... dis 25%
Locks—Door ... dis 25%
Machines—Apple Paring, Turn Table / " " Lightning ... $8·50 ℘ doz
Tinmen's
Doweling, Merchant's, No. 1 ... " 4 75
" " No. 2 ... " 5 00
Mills, Coffee—Box and Slide, common ... dis 10&5%
Box Union and Eagle ... dis 10%
Swift's Patent ... dis 10%
"Champion" ... dis 10&10%
Nails—Cut, Chesapeake ... $5 00 rates
Clout and Finishing ... dis 7½%
Shoe ... dis 7½%

	No. 5	6	7	8	9	10
Horse, Ausable	30	27	25	24	23	22c

" " 1000 lbs ... dis 5%

	No. 6	7	8	9	10
" Clinton	23	21	20	19	18c

Packing—Rubber ... dis 30 @ 33⅓%
Pencils, Slate—Soapstone ... 4 5 6 in. 3040 50c. per 100
Case lots ... dis 20%
Paint—White Lead, U. S. Gov't ... ℔ 9½c
Rivets—Iron, Black and Tinned ... dis 20%
Copper ... dis 10%
Rope—Manila, ½ inch and larger ... ℘ ℔ 17½c
Rules—Boxwood and Ivory, Stephens ... dis 50&10%
Staples—Blind, Boardman's Pat., ½ & ⅝ ... ℘ ℔ 37c
Skates—White's ... dis 20%
Straps, Skate—Russet and Black ... net @ 20%
Spoons—Iron Tinned ... dis 10%
" " by the case ... dis 20%
Plated Rogers' A No. 1 ... dis 25&5%
Squares—Steel and Iron ... new list 50%
Shoes, Horse—H. Burden & Sons ... ℘ keg $6 37½
Shovels & Spades—Shepard, Forsyth & Dennison ... 12½%
Saws—Henry Disston & Sons ... dis 5%
Scales—Buffalo Scale Works ... dis 25%
Fairbanks ... dis 15%
Screws—National Screw Co. Iron ... dis 50
" Brass ... dis 40
Shears—Seymour's ... dis 50%
Tools—Tinmen's ...
Traps, Steel—Newhouse ... dis 17½%
Tacks—Half Weight Am. Iron ... dis 70&7½%
Vises—Parallel, Buffalo ... dis 15%
Wrenches—Coes' genuine ... dis 30%
Coes' Imitation ... dis 50 & 10%
Tafts' Pattern ... dis 62½&10%
Ware—French, Tinned and Iron ... dis 15 @ 20%
Stamped and Japanned ... net
Cast Iron Hollow ... dis 20@30%

METALS.

Tin Plates, Charcoal IC.
10x14 ... $14 50
12x12 ... 15 00
12½x17 ... 14 00
14x20 ... 15 50
Add for each X ... 2 50
14x20 C. terne ... $13 00 @ 14 00
20x28 C. " ... 29 00
20x28 X. " ... 34 00
Pig Tin—Straits ... 41 @ 42c
Banca ... 48 @ 49c
Solder ... No. 1 24c, No. 2 22c; 50 lbs. deduct ½c, 100 " " 1c
Sheet Zinc, "Lasalle," 1000 $11 00, 500 $11 10, 100 ℔ casks $11 30 ℘ 100 ℔s
Iron Wire—Bright and annealed ... dis 10 @ 20%
Coppered ... dis 5 @ 15%
Tinned ... dis 5 @ 15%
Tinned Broom, Nos. 20 20c, 21 21c, 22 21c ... dis 20%
Copper—Sheathing 14@18 oz ... ℘ ℔ 43c
Planished ... ℘ ℔ 49 @ 51c
Bottoms ... ℘ ℔ 45c
Bolts ... ℘ ℔ 45c
Braziers' Sheets ... ℘ ℔ 45c

Sheet Iron—Smooth Finish	Com'n	Char.	Jun
Nos. 10 to 14	6·85	8·35	10·05c
Nos. 15 to 20	7·35	8·75	10·25c
Nos. 21 to 24	7·55	8·95	10·45c
Nos. 25 & 26	7·75	9·15	10·65c
No. 27	7·95	9·35	10·85c

	A.	B.
Am. Russia	15½c	13c

Gen. Russia, No. 1 stained ... 21c
" " " clean ... 22c
Galvanized ... dis 20%

CHICAGO.

Reported by Markley, Alling & Co., Dec. 1872.

AGRICULTURAL IMPLEMENTS.
Scythes.—Dunn Edge Tool Co. ... dis 25%
Hay and Manure Forks.—Otsego extra C. S. ... dis 25%
Hoes & Garden Rakes.—Jackson and Otsego ... dis 25%
Scythe Stones ... dis 25%
Scythe and Bush Snathes ... dis 20%
Harvest Rakes and Barley Forks ... dis 20%
Revolving Horse Rakes ... dis 10%
Handles.—Fork and Shovel ... dis 20%
Cradles.—Nithington, Cooley & Co. ... dis 20%
" Genuine Morgan ... ℘ doz net $36·00%

AUGERS AND BITS.
Ives', extra C. S. ... dis 20%
Jenning's ... dis 5%
Cooks' ... dis 25%
Snell's ... dis 10%
Snell's Car Bits ... dis 10%

AXES.
Amoskeag Yankee ... ℘ doz $13 50
" Crescent ... " 14 00
Hunt's Yankee ... " 14 50
Kennebeck Yankee ... " 12 00
Lippincott " ... " 12 50
" Crown ... " 13 00
" Beveled ... " 13 00
Jefford's Silver Steel ... " 13 00
Red Warrior, Beveled ... " 14 00
Kennebeck, Handled ... " 15 00
Boy's, Handled ... " 12 00

BOLTS.
Carriage and Tire ... dis 50&20%
Cast Barrel and Shutter ... dis 20&10%
Wrought Iron Barrel ... add 10%
" " Square ... net list

BUTTS.
Cast Fast Joint, Narrow ... dis 10%
" " " Broad ... dis 20%
" Loose Joint ... dis 35%
" " Pin, Reversible ... dis 25%
" " Japanned ... dis 25%
" " Silver Tipped ... dis 25%
Wrought Narrow, Fast Joint ... net list
" Broad, Fast Joint ... dis 15%
" " Loose Joint ... dis 15%
" Loose Pin ... dis 15%
" Table ... net list
" Brass ... dis 15%
Garretson's Blind Butts, Wood ... doz sets $2 00
" " " Brick ... doz sets 3 00
Parker's " " Wood ... doz sets 2 25
" " " Brick ... doz sets 3 25

CASTERS.
Iron Plate ... dis 20%
Brass Wheel Plate ... dis 20%
Porcelain Wheel Plate ... dis 20%
" " Bed ... dis 20%
Iron Wheel Bed ... dis 20%

CHISELS.
Butcher's Tanged Firmer ... dis 30%
" Long Paring ... dis 30%
Witherby Socket Framing ... dis 50&15%
" " Firmer ... dis 50&15%
" " Corner ... dis 50&15%
" " Slicks ... dis 50&15%

COFFEE MILLS.
Box 4 Iron ... $3 75
" 103 " ... 5 25
" 102 " ... 7 50
" 107 Britannia ... 7 50
" 106 " ... 9 25
" 25 Union ... 11 00
" 35 " ... 13 00
" 75 Cast Steel ... 11 00
" 85 " ... 13 00
Side 50 ... 4 75
" 60 ... 5 75
" 70 ... 7 25
" 90 ... 18 00
" 15 Union ... 7 00
" 20 " ... 8 00

CUTLERY.
American Table ... dis 20%
" Pocket ... dis 25%

DOOR SPRINGS.
Torry ... ℘ doz $7 50
Rubber ... " 4 00
Boon's ... " 5 00

DRAWING KNIVES.
Witherby Tool Co. ... dis 50&15%
Ohio Tool Co. ... net list

FILES.
Butcher's ... $7 00 £
Nicholson's ... $5 00 @ $5 50 £

HAMMERS.
Maydole's ... net list
Yerks & Plumb ... net "
Cheney ... net "

HANDLES.
Extra Axe ... ℘ doz $3 00
No. 1 Axe ... " 2 25
No. 2 Axe ... " 2 00
R. R. Pick, No. 1 ... " 2 00
Coal " " ... " 2 00
Sledge, No. 1 ... " 2 00
Hatchet ... " 85
Hammer, A. E ... " 8

HATCHES.
Amoskeag Shingling, No. 1 ... ℘ doz $7 25
" No. 2 ... " 8 00
" No. 3 ... " 8 75
" Claw, No. 1 ... " 7 75
" " No. 2 ... " 8 50
" " No. 3 ... " 9 22
" Lath, No. 1 ... " 7 50
" " No. 2 ... " 8 25
" " Solid Steel ... " 12 00

HINGES.
Strap and T ... dis 5%
Screw Hook and Strap, 8 to 12 in ... net, 10c ℘ ℔
" " 14 to 24 in ... net, 9c ℘ ℔
Hook and Eye Hinges ... net 12c @ 16c ℘ ℔
Gate, No. 35, State ... ℘ doz $3 50
" No. 3, In and Out ... " 3 50
" Blinn's Pat ... " 7 50

HORSE NAILS.
Northwestern, 8d ... 24c
Ausable, 8d ... 24c
Globe, 8d ... 26c

KETTLES.
Brass ... net 54%
Enameled ... dis 15%

LOCKS AND KNOBS.
Norwalk Lock Co. ... dis 25%
Branford " ... dis 25%
Eagle " ... dis 15%
American Pad Locks ... dis 25%
Continental Lock Co. ... dis 10%

MEAT CUTTERS.
Haven's Patent ... net list
Hale's " ... dis 10%
Woodruff " ... net list
Stowe's Sausage Stuffers ... net list

MOLASSES GATES.
Stebbin's Patent ... dis 40%
Enterprise " ... dis 5%

NAILS.
10d to 60d ... per keg $5 25

OIL STONES.
Washita No. 1 ... net 35c ℘ ℔
" Slips ... net 65c "
Hindostan No. 1 ... net 9c "
" Axe ... net 10c "
" Slips ... net 15c "

PICKS AND MATTOCKS.
Picks, Railroad, Axe Finish ... ℘ doz. $13 50
" Coal, Axe Finish ... " 10 00
Mattocks, L. C., Axe Finish ... " 16 50
" S. C., " ... " 16 00
Grub Hoes, Axe Finish, No. 2 ... " 12 00

PLANES.
Ohio Tool Co. Bench ... dis 10%
Sciota ... dis 15%
A. Howland & Co. Bench ... dis 10%
" " Fancy ... dis 10%
Bailey Patent Iron ... dis 15%
Plane Irons, Butcher's ... dis 30%

RIVETS.
Iron ... dis 10 @ 15%
Tinned ... dis 10 @ 15%
Copper, No. 7 ... net, ℘ ℔, 60c

RULES.
Stanley Rule and Level Co. ... dis 40&10%
Hubbard & Curtiss Mfg. Co. ... dis 40&10%

SAD IRONS.
Best A No. 1 ... ℘ ℔, net, 5½c
" Copper Face Star ... " 5½c

SANDPAPER.
Wiggin & Stevens, No. 0 to 1½ ... ℘ ream, net, $4 50
" " No. 2 to 3 ... " " 5 00

SASH LOCKS.
Champion ... ℘ gross, net, $12 00
Hopkins & Dickinson ... dis 10%
Judd's Patent ... dis 10%
Corbin's Patent ... dis 10%
Clark's " ... dis 20%

SAWS.
H. Disston & Sons ... dis 5%
Champion X Cut ... ℘ foot, net, 60c
M. A. & Co. X Cut ... " " 50c

SCREWS.
American Screw Co.—Iron ... dis 45&5%
" " —Brass ... dis 25%
" " —Blued Rd. Head ... dis 25%

SHOVELS AND SPADES.
Ames' Black Shovels ... ℘ doz $15 00
" Polished " ... " 16 00
" Patent " ... " 18 00
Alling " " ... " 15 00
" " Molders' ... " 18 00
Crane's Black " ... " 12 00
" Polished " ... " 13 00
Smith's " " B. S. L. H. Rd. Pt. " 13 50
" " " B. S. D. H. Rd. Pt. " 14 00
Ames' Black Spades ... " 16 50
" Polished " ... " 17 50
" Patent " ... " 18 00
Alling " " ... " 15 50
Crane's Black " ... " 12 50
" Polish'd " ... " 13 50

SCOOPS.
Alling Steel Polished, No. 2 ... ℘ doz, $14 00
" " No. 3 ... " 14 50
" " No. 4 ... " 15 00
" " No. 5 ... " 16 00
" " No. 6 ... " 17 00
" " No. 7 ... " 18 00
" " No. 8 ... " 19 00
" " No. 10 ... " 22 00
Crane's Polished, No. 5 ... " 14 00
" " No. 6 ... " 15 00
" " No. 7 ... " 16 00
" " No. 8 ... " 17 00
Crane's Black Coal, No. 4 ... " 18 00
" " No. 5 ... " 18 50
Preston, Black Scoops No. 1 ... ℘ doz $12 00
" " " " 2 ... 12 50
" " " " 3 ... " 13 00
" Half Pol. Scoops No. 1 ... 13 00
" " " " 2 ... 13 50
" " " " 3 ... 14 00
Lippincott, Half Pol. No. 2 ... 16 00
" " " 3 ... " 17 00

WRENCHES.
Taft's ... dis 60%
Coe's Imitation ... dis 45%
Coe's Genuine ... dis 25%

WRINGERS.
Novelty Clothes Wringer ... ℘ doz $72 00
Universal " ... " 72 00
Mead's " ... " 55 00

Iron. (Pittsburgh classifications.)
Flat Bars ... ℘ ℔ 5·0 @ 5·2
Heavy Bands ... 5·4 @ 6·0
Light Bands ... 5·8 @ 7·0
Hoops ... 6·1 @ 9·3
Rounds & Squares ... 4·8 @ 8·4
Ovals ... 5·0 @ 6·4
Half Ovals & Half Rounds ... 5·7 @ 8·4
Horse Shoe ... 6·5

SHEETS.
No. 10 to 14 ... 6·6
No. 15 to 20 ... 6·8
No. 21 to 24 ... 7·0
No. 25 to 26 ... 7·2
No. 27 ... 7·4

HORSE NAILS.

Northwestern, Nos.	5	6	7	8	9	10
Cents ℘ ℔	30	27	25	24	23	22
Ausable	30	27	25	21	23	22

Pig Iron.
Scotch—
Gartsherrie ... $ @ 63 00
Coltness ... @ 63 00
Summerlee ... @ 63 00
Glengarnock ... @ 62 00
Eglinton ... @ 62 00
Carnbroe ... @ 61 00
Calder ... @ 61 00
Dalmellington ... @ 61 50
Langloan ... @ 61 00
Monkland ... @ 60 00
Clyde ... @ 60 00
Govan ... @ 60 00
Charcoal—
Lake Superior No. 1 ... @ 60 60
" " 2 ... @ 59 00
Stonecoal—
Chicago, No 1 ... @ 56 00
" " 2 ... @ 55 00
Missouri " 1 ... @ 58 00
Massilon No. 1 ... @ 61 00
No. 1, Grand Tower ... @ 57 00
No. 2, " ... @ 56 00
Car-wheel—
Salisbury, all numbers ... @ 75 00
Champion " ... @ 60 00
Red River " ... @ 65 00

Steel.

THREE 1st CLASS PRIZE MEDALS. CLASSES 1, 21, 22, Great Exhibition of Industry, LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1st UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

COCKER BROTHERS,

SUCCESSORS TO

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(Established 1752.)

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MANUFACTURERS OF

CAST, SHEAR, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES. &c.

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SHEFFIELD, ENGLAND.

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CHICAGO, Crerar, Adams & Co.....ST LOUIS, Henry Bakewell & Sons.
CINCINNATI, Augustus Wessel.....NEW ORLEANS, Folger & Co.
SAN FRANCISCO, Russell & Erwin Manufacturing Co.

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MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES, and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel.
Also, manufacturer of

Sheet Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel

And GENERAL MERCHANT.

A. M. F. WATSON, General Agent.

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BARROW HÆMATITE STEEL COMPANY

LIMITED.

TRADE MARK

BARROW IN FURNESS,

LANCASHIRE, England

MANUFACTURERS OF

STEEL RAILS, TYRES, WHEELS,

Axles, Shafting, Boiler and Ship Plates, Bessemer Pig Iron, &c., &c.

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MANUFACTURERS OF SUPERIOR

STEEL

For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

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DOG BRAND FILES,

Unsurpassed, if equaled, in quality.

Bailey Lane Works, Sheffield, England.

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Established 1810.

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HENRY MOORE, Attorney.

Steel.

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(LIMITED)

MANUFACTURERS OF THE

CELEBRATED CAST STEEL,

WARRANTED MOST SUPERIOR FOR TOOLS.

DARNALL WORKS,
ATTERCLIFFE FORGE,
WEST STREET WORKS, } SHEFFIELD, ENGLAND.

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AND

AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.

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BOSTON, H. L. Richards, 18 Batterymarch.
PHILADELPHIA, Wm. H. Sowers.
CLEVELAND, O., Cleveland, Brown & Co.
NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BALTIMORE, Md., Wm. H. Cole.
MONTREAL, Saint Paul St.
NEW HAVEN, Ct., Atwater, Wheeler & Co.

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97 John Street, NEW YORK,

Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

JOHN HOGAN, Agent.

S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear

STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel in any of the varieties above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class Material in quality, temper, and durability is needed.

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills,** &c.

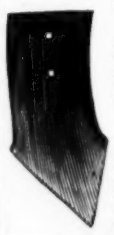
Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

☞ *Makers of the Celebrated ROCK BORING DRILL STEEL.*

Warehouse, 96 John Street, New York.

A. J. NELLIS & CO., Pittsburgh, Pa.

MANUFACTURERS OF



Agricultural Steels and Irons

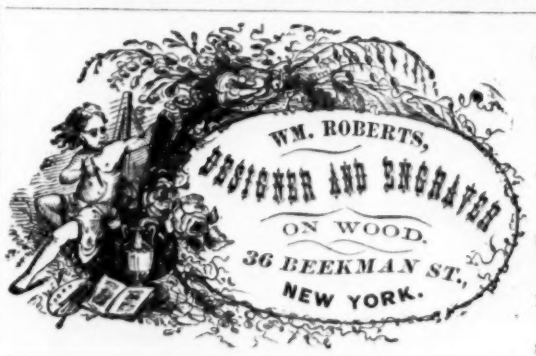
OF ALL KINDS AND SIZES. BEVELED, BOLTED, FINISHED AND TEMPERED TO SUIT ALL KINDS OF SOIL.

Nellis' Original Harpoon Horse Hay Fork Improved.

Nellis' Grapple & Pulleys.

☞ Send for Pamphlet.

With the exception of our Horse Hay Fork and Fixtures we make no complete Implement. Agricultural Steels and Irons we make a specialty. From the universal approval our goods have secured by actual test in the hands of Implement Makers and Farmers from the Atlantic to the Pacific, and with our facilities, experience and improvements, we frankly assure the Trade of our ability to meet the requirements of the age. All of our Steel Goods have imprint of our Trade Mark.



Established 1838.

EVERY DESCRIPTION OF ENGRAVING FOR

BOOK, CATALOGUE OR NEWSPAPER USE

done at short notice.

Machinery.

VIEWS OF BUILDINGS

A SPECIALTY.

FIRST-CLASS WORK AT LOW PRICES.

SATISFACTION GUARANTEED.

PHENIX

FIRE AND MARINE INSURANCE CO.,

Brooklyn, N. Y.

Principal Office, No. 173 Broadway.

Cash Capital.....$1,000,000 00
Net Cash Assets.....

BIRMINGHAM, ENGLAND

SAMUEL A. GODDARD & CO.,

Commission Merchants and General Agents,

execute orders for British manufactures on the lowest terms, and collect and forward goods for a very moderate payment. Agents for the sale of North Staffordshire Iron of a standard quality.

Steel.

Sheffield Steel Works.

(Established in 1848.)

SINGER, NIMICK & CO.

Pittsburgh, Pa.,

Manufacturers of **Extra Quality Tool**

CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel,

Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, Crow Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS,

Minerva Iron & Steel Works,

Wolverhampton, England,

MANUFACTURER OF

"Jenks' Spring Steel," and Cast Spring Steel,

Also, TIRE, TOE CORK, SLEIGH SHOE, BLISTER AND PLOW STEEL.

VAN WART & McCOY,

SOLE AGENTS,

43 Chambers St., New York.

A full assortment of "Jenks' Spring Steel," in stock.

MILLER, BARR & PARKIN,

Crescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.,

PITTSBURGH, PA.

Gunpowder.

GUNPOWDER.

DUPONT'S

Sporting, Shipping, and Mining

POWDER.

DUPONT'S GUNPOWDER MILLS,

ESTABLISHED IN 1801,

Have maintained their great reputation for 70 years. Manufacture the

Celebrated Eagle Ducking, Eagle Rifle and Diamond Grain Powder.

Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER

of all kinds and descriptions.

For sale in all parts of the country. Represented by

F. L. KNEELAND,

70 Wall Street, NEW YORK.

GUN-POWDER

LAFLIN & RAND POWDER CO.,

21 Park Row, New York,

invite the attention of the the Hardware Trade to their facilities for delivering

BLASTING, MINING and RIFLE

POWDER

IN EVERY PART OF THE UNITED STATES, from having agencies and magazines at all prominent points, beside our works at

Newburg, Saugerties, Kingston, and Catskill, N. Y.; Scranton, Carbondale, and Pottsville, Pa.; Baltimore, Md., and Platteville, Wis.

The superiority is well known of our brands Rifle Powder:

Orange Rifle, Orange Ducking Lightning, Audubon.

SAFETY-FUSE at wholesale.

Chicago Metal Market.

(Reported by Cragin Bros. & Co., 141, 143, and 145 Lake street.)

CHICAGO, Feb. 25, 1873.

Tin Plate.

IC, 10x14, Coke	$13 50	IXX, 14x20, Charcoal	21 50
IC, 10x14, Charcoal	14 50	IXXX, 14x20, "	24 50
IX, 10x14, "	17 50	IXXXX, 14x20, "	27 50
IC, 12x12, Coke		IX, 14x14, "	29 00
IC, 12x12, Charcoal	15 00	DC, 100 Plate, "	14 50
IX, 12x12, "	18 00	DX, "	17 50
IC, 14x20, Coke	14 00	DXX, "	20 50
IC, 14x20, Charcoal	15 50	DXXX, "	23 50
IX, 14x20, "	18 50		
IC, 14x20, Coke Roofing			
IC, 14x20, Charcoal Roofing			14 00
IX, 14x20, "			17 00
IC, 20x28, "			29 50
IX, 20x28, "			34 50

Pig Tin.

Large, 60 ℔	40c	Bar Tin	42c
Small, 30 ℔	41c		

Zinc.

In casks 1000 ℔s	10¼c	In sheets	11c
" 500 "	10¾c	Slab	9c

Copper.

Copper Bottoms	45c
Sheathing Copper	43c
Planished Copper, 14x48	51c
Size, 14x52, 14x56, 14x60 Nos. 7 8 9	Planished Copper 53c

Braziers' Sheets, 30x60.

6 to 8 lbs	51c	Ingot Copper	
10 and 12 lbs	48c	Bolt "	50c
15 to 100 lbs	45c		

Solder.

Fine, C. B. & Co.'s B'nd.	25c	Plumbers' Solder, No. 1	23c
Ordinary	23c	" No. 2	21c

Babbit Metal 15c. @ 25c.
Galvanized Iron Conductor Pipe ℔ 10c

Sheet Iron.

	Common.	Smooth.	Charcoal.
No. 14 to 24	7 c	7¼c	9¼c
25 & 26	7¼c	8 c	9¾c
27	7¾c	8¼c	9¾c

Add ¼c ℔ lb for 30 in. wide.

Galvanized Iron dis 20 %

No. 16 to 20	15c	No. 27	18c
21 to 24	16c	28	20c
25 & 26	17c		

Russia Iron.
Perfect, all numbers 30c
In Sheets, 1c. higher.

Braziers' Rods.
¼ in., 10 ft. long ℔ lb, 8c | 3-16 in., 10 ft. long ℔ lb, 10c

Lead.

Pig	8½c	Lead Pipe, when cut	11½c
Bar	10c	Sheet Lead	11c
Lead Pipe, in full coils	11c		

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers of Metals, No. 214, 216 and 218 Main street.

Tin Plate.

I. C. 10x14 Charcoal	$14·00 @ $15·00
I. C. 10x14 best Coke	13·50 @ 14·50
I. C. Terne, 14-20	12·50 @ 14·00
I. C. " 20-28	28·50 @ 29·50
I. C. Continuous	27·00

Pig Tin.

Banca	none in town	English	41c
Straits	40c		

Solder.

S. & Co.	℔ lb 27c	Roofing	℔ lb 24c
A 1.	" 25c		

Lead.
Pig ℔ lb 7½c @ 8c. | Bar ℔ lb 8½c @ 9c

Copper.

Ingot	none in town	Brazier, 6 to 9 lb	℔ lb 51c
Planished	℔ lb 51c @ 54c	" 10 to 14 lb	" 48c
Sheathing	" 46c @ 48c	" 14 to 100 lb	" 45c
Bolt	" 45c	Copper Bottoms	" 48c

Zinc.
Cask, 500 to 1000 lbs ℔ lb 11½c @ 11¾c
Case, 100 lbs " 11½c @ 12c
Slab " 7¾c @ 9c

Brass.

Roll, No. 6 to 30	℔ lb 45c	Wire, No. 0 to 20	℔ lb 50c
" 30 to 38	" 50c	" 20 to 25	" 60c
" 38 to 40	" 65c		

Babbit Metal.

Sellew & Co.	℔ lb 35c	Market	℔ lb 15c
Black Lead	" 25c		

Antimony ℔ lb 22c
Bismuth ℔ lb $6 00
Nickel ℔ lb $3 00

Sheet Iron.
Russia ℔ lb 19 @ 22c | Am Russia A ℔ lb 14 @ 15c; " B " 13 @ 14c

	Com. B.	Smooth Flu. S.	L. U.	Smooth D. Re'fd.
18 to 20	6·3c	7·5c		8·5c
22 to 24	6·5c	7·8c		9·0c
26	6·8c	8·0c		9·2c
27	7·0c	8·2c		9·4c
30	8·2c			

Galvanized Iron—Full bundles, dis 15 @ 20 %.

Nos. 18 to 20	15c	No. 27	18c
22 to 24	16c	28	20c
25 to 26	17c		

Bar Steel, Silver, ℔ lb 22c; Crescent, 17¼ @ 18c.
Iron Wire, discount, 10 @ 15 %.
Enameled Ware, discount, 15 @ 20 %.

One Piece Corrugated Elbows.

Charcoal Iron.		Russia Iron.	
4½ inch	℔ doz $3·75	4½ inch	℔ doz $8·00
5 "	" 4·25	5 "	" 10·00
5½ "	" 5·25	5½ "	" 13·00
6 "	" 5·25	6 "	" 13·00
7 "	" 6·50	7 "	" 14·00

Leader Elbows—Flat Crimp Retinued.

	℔ doz.		℔ doz.
2-inch	$2 00	2½-inch	$2 25
3-inch	2 50	3½-inch	3 00
4-inch	3 50	4½-inch	4 00

Sheet Iron Bread Pans, ℔ lb 12½ @ 13c.
American Broilers, ℔ doz, $12 @ $15.
Tinmen's Machines, net list, add 5 %.
Sad Irons, ℔ lb, 5½c. @ 5⅝c.
Brass Kettles, Ansonia, 33c. @ 54c.; L. & G., 50c.
Wrought Iron Pipe dis 45 %

Inside Diameter, Inches	⅛	¼	⅜	½	¾	1	1¼
Price, ℔ foot	·12	·12	·14	·13	·25	·34	·48
Weights of Pipe, ℔ foot	·24	·42	·56	·85	1·12	1·67	2·25

Inside Diameter, Inches	1½	2	2½	3	3½	4
Price, ℔ foot	·60	·85	1·25	1·75	2·10	2·75
Weights of Pipe, ℔ foot	2·69	3·66	5·77	7·54	9·05	10·72

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Anvils.

Armitage	℔ lb, gold, 13c
Peter Wright's	" 13½c
Wilkinson's	" 12½c

Apple Parers.

Conqueror	℔ doz, $8 50
Lightning	" 8 50
Turn Table	" 8 50

Augers and Bits.

Cook's	dis 25 %
Ives'	dis 20 %
Jennings'	dis 5 %
Snell's	dis 10 %

Axes.

Hunt's	℔ doz $14 00 @ 15 00
Lippincott's	" 13 50 @ 14 50
Lippincott's Pioneer	" 14 00 @ 15 00
Simmons'	" 13 50 @ 14 50

Axles.
Kritch & Crane Mfg. Co.'s—

Patent Taper Axles	dis 5 %
Swelled Taper Axles	dis 5 %
Concord Axles	dis 5 %
Red Jacket Axles	dis 5 %
Common Axles, 1¼ inch and upward	℔ lb, 9 c
" " less than 1¼ inch	" 9½c

Bells.

Troy, Church	℔ lb, 55c
Light Brass, Hand	dis 50 %
Moore's, Cow	dis 20 %

Bolts.

Arms, Bell & Co.'s Machine	dis 10 %
" " " Carriage and Tire	dis 60&5 %
Norway Iron Carriage and Tire	dis 45&5 %
Cast Iron Barrel, Shutter, &c.	dis 30 %

Cast Butt Hinges.

Narrow Fast Joint	dis 15 %
Broad " "	dis 30 %
" Loose "	dis 40 %
Reversible	dis 30 %
" Japanned and Silver Tipped	dis 30 %
Loose Joint " " "	dis 20 %
Excelsior Reversible Blind	dis 25&5 %
Lull & Porter's Blind	dis 25&5 %

Wrought Butts.

Narrow	dis 10 % off list
Reversible	dis 15 %
Broad	dis 15 %
Table Hinges	net list
Back Flaps	net list
Inside Blind Hinges	net list

Casters.

Porcelain Wheel Bed or Plate	revised list dis 10 %
Iron or Brass " "	

Chain.

English Coil	3-16	¼	5-16	⅜	7-16	½ in.	
	15	12¾	11¾	11	10¼	10c	gold
Trace				6½-10-2		75c	"
				7-10-2		80c	"
German Coil and Halter						new list add 25 %	"

Chisels.
Socket, Firmer or Framing dis 55 %

Clothes Wringers.

Colby's	℔ doz $66 00
Novelty	" 72 00
Universal	" 72 00
Monitor	" 72 00

Coffee Mills.

Parker's	net list
P. S. & W. Co.'s	dis 5 %

Corn Knives.

Dunn Edge Tool Co.'s Clipper	℔ doz $5 75
Disston's	" 5 75

Crow Bars.

Steel Pointed	℔ lb 8 @ 10c
Solid Cast Steel	" 30c

Cutlery.
J. Russell & Co.'s, Lamson, Goodnow & Co.'s, Landers, Frary & Clark's } new list, dis 15 %

Files and Rasps.

Nicholson's Mill Files	$5 50 to the £, currency
Nicholson's Other Files	5 00 to the £, currency
Butcher's Files	7 00 to the £, currency
Heller's Horse Rasps	$10 00 to the £, currency, dis 40 %

Forks and Hoes.

Auburn Mfg. Co.'s Hay and Manure Forks	dis 25 %
" " Handled Hoes	dis 20 %
" " Planter Eye Hoes	add 15 %
Winsted's Planter Eye Hoes	add 15 %

Hammers.

Yerkes & Plumb	new list net
Masons' Hammers	℔ lb 20c
Smith Hand Hammers	" 22c

Handles.

	Extra.	No. 1.	No. 2.	No. 3.
Axe	$2·75	$2·25	$1·75	$1·00
Pick	Extra. $2·50	No. 1. $2·00	No. 1½. $1·75	No. 2. $1·25

Smith & Montross Fork, Hoe and Rake dis 10 %
" " Broom and Mop $12 @ $18 ℔ M.

Harrow Teeth.

1 inch iron	℔ lb 6c
⅞ and ¾ inch iron	" 6c
⅝ inch iron	" 6¼c
Barbed or Headed	¼c extra

Hatchets.

Hunt's	add 5 %
Simmons'	dis 5 %

Hay Knives.

Lighting	℔ doz $24 00
Dunn Edge Tool Co.'s	℔ doz $14 50—dis 10 %
Fisher's	" 16 50—dis 10 %

Hinges.
Strap and T—St. Louis make dis 10 % off list

Horse Nails.

Eureka	23c rates
Ausable	22c "
Northwestern	22c "
Eagle	19c "
Globe	25c "

Horse Shoes.

Rhode Island (Perkin's pattern)	℔ keg $7 00
Burden's	" 7 00
Mule Shoes	$1 00 extra
Rhode Island Trotting Shoes	2 50 "

Locks and Latches.

Jones & Nimick's	dis 20 %
Moorhead, Adams & Co.	dis 20 %
Norwalk Lock Co.'s revised list	dis 20 %

Mattocks and Grub Hoes.

Klein, Logan & Co.'s Mattocks	℔ doz. $14 25 @ 15 75
" Grub Hoes, Oval Eye	℔ doz. 11 00 @ 12 50

Nails.
Wheeling $5 15 rates.

Picks.

Klein, Logan & Co.'s	R. R. and Clay	℔ doz.	$12 00
" "	Coal	"	9 75
" "	Poll	"	12 00
" "	Stone	"	16 50
" "	Tamping	"	19 00

Planes.

Ohio Tool Co.'s	net list
Eastern	dis 5 %

Sad Irons.
Monitor Brand, Silver Polished ℔ lb 6c

Sash Weights.
Standard Solid Eyes ℔ lb 3½c

Saws.

Disston's	dis 5 %
Spear & Jackson's	$5 00 to £ gold
Hubbard, Lippincott, B. & Co.'s	dis 10 %
Branch, Crooks & Co.'s	dis 10 %
Livingston's Patent Buck	net list

Screws.

American Screw Co.'s revised list	dis 45 %
$2000 worth in 6 months	2½ % extra

Scythes.

Blood's C. S. & G. S.	net list
Dunn's Edge Tool Co.'s	net list
Paris Furnace Co.'s	dis 20 %
Waldron's English	$9 00 to £

Scythe Sotnes.

No. 1 Indian Pond	℔ gross,	$ 7 00	dis 25 %
Extra " "	"	7 50	
Premium " "	"	9 50	
Diamond Grit	"	13 50	

Shovels, Spades and Scoops.

Ames'	add $1 00 to list
Lippincott's	new list net
Rowland's, Maxwell	revised list

Sledges.

Smith's Stone or Coal Sledges—	
Steel Face Polished	℔ lb, 17c
Solid Cast Steel	" 35c
Striking Sledges	℔ lb extra, 1c

Snaths and Cradles dis 20 %

Springs.

Cleveland Spring Co.'s—	
Carriage and Express	net list
Blue Seat Springs	dis 20 %

Tacks.

Norway Tack Co.'s ½ weight	dis 70 %
Brads	dis 50 %

Traps.

Newhouse Patent			dis 12½ %
Reichard's Animal,	Wood Bottom	℔ doz	$10 00
" "	Metal Bottom	"	12 00

Vises.

Solid Box	℔ lb 18c
Wilson Mfg. Co.'s	dis 15 %

Wrenches.

Coes' Genuine	dis 25 %
" Pattern	dis 40 %
Taft's	dis 50 %

London Metal Market.

(From The Mining Journal.)

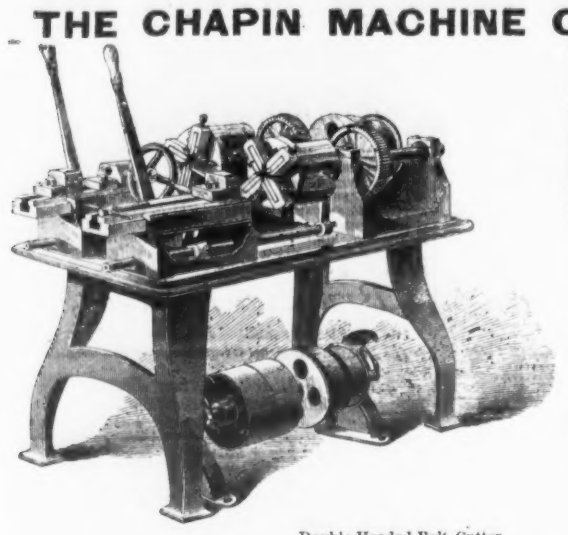
	£.	s.	d.	£.	s.	d.
Copper—℔ ton.						
Best Selected	95	0	0	96	0	0
Tough Cake & Tile	92	0	0	96	0	0
Sheathing and Sheets	96	0	0	100	0	0
Bolts	102	0	0	103	0	0
Bottoms	103	0	0	—		
Old (Exchange)	84	0	0	—		
Burra Burra	90	0	0	91	0	0
Wire	℔ lb. 0	1	1¼	—		
Tubes	" 0	1	0½	0	1	1
Brass—℔ lb.						
Sheets	0	0	10	0	0	10½
Wire	0	0	10½	—		
Tubes	0	0	11¼	0	0	11½
Yellow Metal Sheathing	0	0	8½	0	0	9
Sheets	0	0	8¾	0	0	9
Tin—℔ ton.						
English Blocks	146	0	0		—	
Ditto Bars	147	0	0		—	
Ditto Refined	149	0	0		—	
Banca	147	0	0		—	
Straits	144	0	0	145	0	0
***Tin Plates**—† ℔ box.						
IC Charcoal	1 qual.	2	1	0	2	2	0
IX "	1 qual.	2	7	0	2	8	0
IC "	2 qual.	1	18	0	2	1	0
IX "	2 qual.	2	4	0	2	7	0
IC Coke		1	15	0	1	16	0
IX "		2	1	0	2	2	0
Canada Plates	℔ ton.	24	0	0		—	
"	at works	21	0	0	22	0	0
Spelter—℔ ton.						
Foreign		25	0	0		—	
To arrive						—	
Zinc—℔ ton.						
In Sheets		32	10	0	33	0	0
Iron—℔ ton.						
Bars Welsh, in London		12	10	0	12	15	0
"	to arrive			nom.			
Nail Rods				"			
Nail Rods, Staff'd in L'ndon		13	0	0		—	
Bars		14	0	0	15	0	0
Hoops		14	10	0	15	10	0
Bars at Works		13	0	0	14	0	0
Hoops ditto		14	0	0	15	0	0
Sheets, single		17	10	0	18	10	0
Pig, No. 1, in Wales		6	0	0	7	0	0
Refined metal ditto		7	0	0	8	0	0
Bars, common, ditto		11	10	0		nom	
Do, merchant, Tyne or Tees		12	0	0		—	
Ditto, Railway, in Wales		11	0	0	11	10	0
Ditto, Swedish, in London		17	10	0	18	0	0
To arrive						—	
Pig, No. 1, in Clyde		6	16	0	7	5	0
Ditto, f.o.b., Tyne or Tees		4	10	0	5	10	0
Ditto, Nos. 3, 4, f.o.b.						—	
Railway Chairs		5	5	0	6	0	0
" Spikes		12	10	0	14	0	0
Indian Ch'coal Pigs in L'don		7	0	0	8	0	0
Steel—℔ ton.						
Swedish, in kegs (rolled)						—	
Ditto (hammered)		18	10	0	19	0	0
Ditto, in faggots						—	
English, spring		20	0	0	25	0	0
Quicksilver—℔ bottle		13	0	0		nom	
Lead—℔ ton.						
English Pig, common		22	10	0	22	15	0
Ditto, LB		23	10	0		—	
Ditto, WB		23	0	0		—	
Ditto, Sheet		23	5	0	23	10	0
Ditto, Red Lead		25	0	0		—	
Ditto, White		29	0	0	31	0	0
Ditto, Patent Shot		23	0	0	23	5	0
Spanish		22	0	0	22	15	0

* At the works, is. to is. 6d. per box less. Terne Plates 2s. per box below Tin Plates of similar brands. † Add 6s. for each X.

Machinery, &c.

THE CHAPIN MACHINE COMPANY,

NEW HARTFORD, CONN.



Double Headed Bolt Cutter.

Manufacturers of the latest improved

BOLT MACHINERY,

Double and Single Head Bolt Cutters,

Will cut from 5000 to 10,000 per day.

Chapin Header

Will head from ¾ iron down. Will head 10,000 Bolts per day

Send for Circular.

BUSH HILL IRON WORKS,

Corner 16th & Buttonwood Streets,

PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE,)

Engineer, Machinist, Founder and Boilermaker,

CASTINGS of every description.

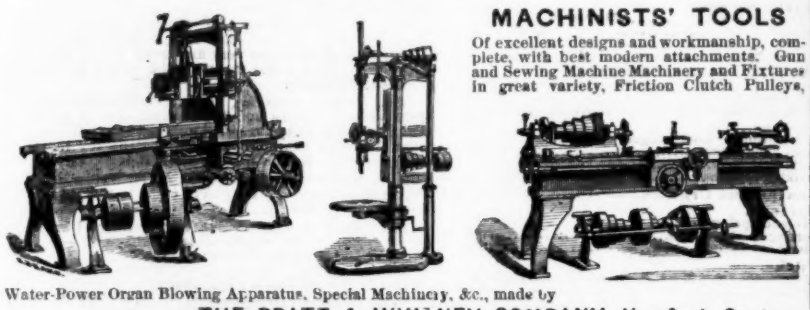
ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE.

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

Sugar Mill, Saw Mill and Grist Mill Machinery,

AND MILLWRIGHTING IN GENERAL.

BOILERS---FLUE, TUBULAR AND CYLINDER, and all kinds of TANK AND PLATE IRON WORK.



MACHINISTS' TOOLS

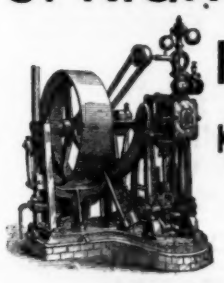
Of excellent designs and workmanship, complete, with best modern attachments. Gun and Sewing Machine Machinery and Fixtures in great variety, Friction Clutch Pulleys,

Water-Power Organ Blowing Apparatus, Special Machinery, &c., made by

THE PRATT & WHITNEY COMPANY, Hartford, Conn.

UPRIGHT BALANCE ENGINE

AND



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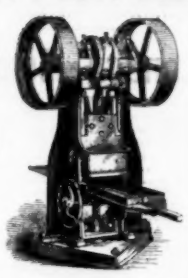

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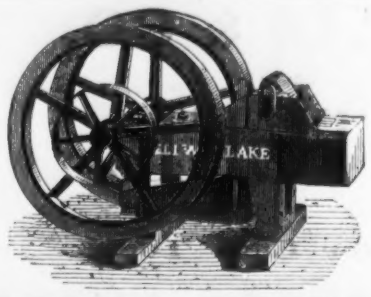

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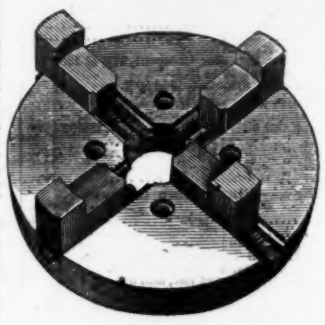

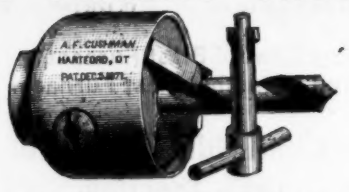

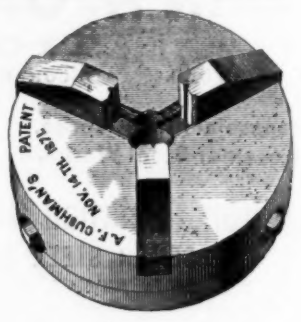

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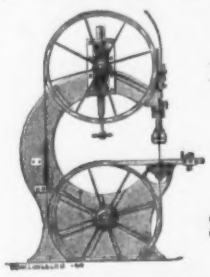

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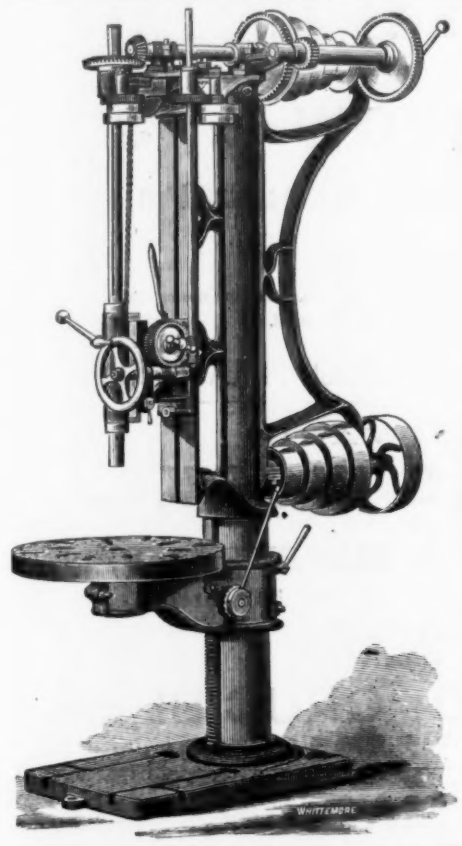

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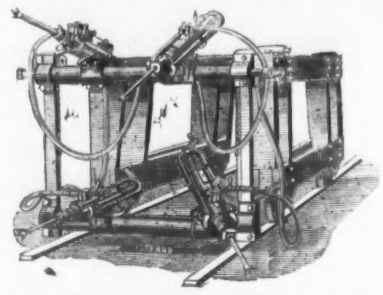

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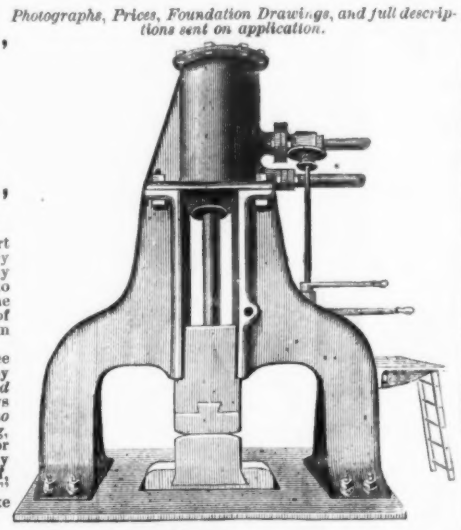

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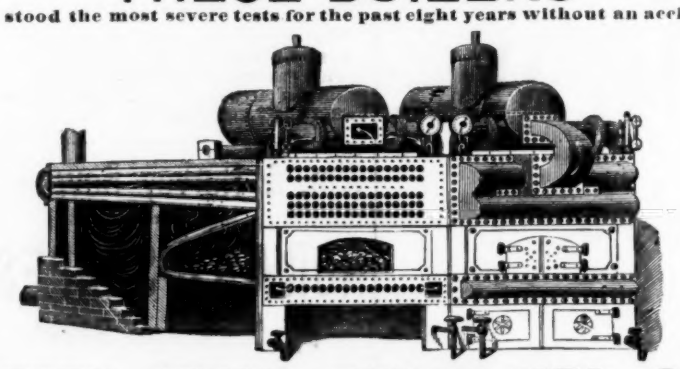

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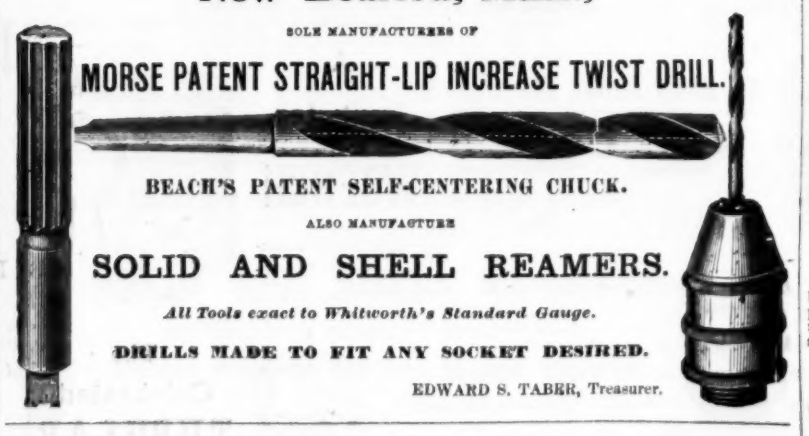

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